Zootaxa 3821 (4): 401–424
www.mapress.com/zootaxa/

Article

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

http://dx.doi.org/10.11646/zootaxa.3821.4.1
http://zoobank.org/urn:lsid:zoobank.org:pub:E2792744-6620-40DA-83C7-7BC92E3B302C

Revision of the genus *Tanycypris* (Ostracoda, Cypricercinae) with the description of *Tanycypris alfonsi* n. sp., and an identification key to the genus

CHRISTINA NAGLER[1], JUERGEN GEIST[1] & RENATE MATZKE-KARASZ[2*]

[1]Aquatic Systems Biology Unit, Department of Ecology and Ecosystem Management, Technische Universitaet Muenchen, Muehlenweg 22, 85350 Freising, Germany.[2]Department of Earth and Environmental Sciences, Palaeontology and Geobiology, GeoBio-Center[LMU], Ludwig-Maximilians-Universitaet Muenchen, Richard-Wagner-Str. 10, 80333 Muenchen, Germany.*
**corresponding author, email: matzke-karasz@lmu.de*

Abstract

Specimens of a new species of the non-marine ostracod genus, *Tanycypris* Triebel, 1959 were found in samples from water plant containers, displayed in a greenhouse of the botanical garden in Munich, Germany. Beside the ubiquitous species *Cypridopsis vidua* O.F. Müller, 1776, the samples contained four alien species of the subfamily Cypricercinae, namely *Chlamydotheca arcuata* Sars, 1901, *Strandesia bicuspis* Claus, 1892, *Tanycypris centa* Chang *et al.*, 2012, and *Tanycypris alfonsi* n. sp.. The genus *Tanycypris* has mainly been reported (native) from Asia, and (invasive) from Italian rice fields.

The Cypricercinae unite all species possessing a Triebel loop, a character of the caudal rami attachment. The subfamily is split into the tribes Cypricercini McKenzie, 1971, Bradleystrandesiini Savatenalinton & Martens, 2009 and Nealecypridini Savatenalinton & Martens, 2009, the latter of which comprises the genera *Tanycypris* Triebel, 1959, *Astenocypris* G.W. Müller, 1912*, Diaphanocypris* Würdig & Pinto, 1990 and *Nealecypris* Savatenalinton & Martens, 2009.

During the process of describing the new species, a number of taxonomic uncertainties were detected within the genus *Tanycypris*, leading to a revision of the nine species currently ascribed to it: *Tanycypris camaguinensis* (Tressler, 1937), *Tanycypris centa* Chang *et al.*, 2012 *Tanycypris clavigera* (G.W. Müller, 1898) (now: *Nealecypris clavigera* nov. comb.), *Tanycypris madagascarensis* (G.W. Müller, 1898), *Tanycypris marina* (Hartmann, 1965) (now: *Dolerocypris marina* nov. comb.*)*, *Tanycypris pedroensis* (Tressler, 1950) (now: *Diaphanocypris pedroensis* nov. comb.), *Tanycypris pellucida* (Klie, 1932), *Tanycypris siamensis* Savatenalinton & Martens, 2009a, and *Tanycypris telavivensis* (Krampner, 1928) (now: *Herpetocypris telavivensis*). An identification key has been developed to the species of the genus *Tanycypris*.

Key words: Nealecypridini, Wouters organ, Rome organ, Triebel loop, invasive species, alien species

Introduction

The approximately 2000 living non-marine ostracod species (Martens & Savatenalinton 2011) are divided into three superfamilies, the Darwinuloidea, Cytheroidea and Cypridoidea, the majority of which belong to the superfamily Cypridoidea (Meisch 2000). The genus *Tanycypris* belongs to the family Cyprididae Baird, 1845 and to the subfamily Cypricercinae McKenzie, 1971, which is the most common ostracod subfamily in the tropics, with 11 genera. These genera are: *Astenocypris* G.W. Müller, 1912, *Bradleycypris* McKenzie, 1982, *Bradleystrandesia* Broodbakker, 1983, *Bradleytriebella* Savatenalinton & Martens, 2009b, *Cypricercus* Sars, 1895, *Diaphanocypris* Würdig & Pinto, 1990, *Nealecypris* Savatenalinton & Martens, 2009a, *Pseudostrandesia* Savatenalinton & Martens, 2009, *Spirocypris* Sharpe, 1903, *Strandesia* Stuhlmann, 1888, *Tanycypris* Triebel, 1959. The Cypricercinae are defined by a peculiar morphology of the caudal rami (CR) attachment, forming a closed loop. This trait was named after Walter Triebel, who first described it (Triebel 1959). Savatenalinton & Martens (2009a) arranged the genera of the Cypricercinae into three tribes: Bradleystrandesiini, Cypricercini, Nealecypridini. Nealecypridini includes the genus *Tanycypris* and the monospecific genera *Astenocypris, Diaphanocypris* and *Nealecypris*.

Accepted by S. Ahyong: 13 Jun. 2014; published: 24 Jun. 2014

TABLE 1. Geographic records of 11 examined species, according to the current classification with the respective references (a = Brady 1904, b = Brady 1913, c = Broodbakker 1984, d = Bronshtein 1947, e = Chang *et al.* 2012, f = Ferguson 1967, g = Fox 1965, h = Furtos 1936, i = Hartmann 1965, j = Higuti *et al.* 2007, k = Klie 1932, l = Klie 1933, m = Klie 1939, n = Krampner 1928a, o = Martens 1994, p = Martens *et al.* 1992, q = McKenzie 1971, r = McKenzie & Moroni 1986, s = Moroni 1967, t = Müller 1898 , u = Okubo 1972, v = Okubo 2004, w = Petkovski 1964, x = Ramirez 1967, y = Rome 1965, z = Savatenalinton & Martens 2009a, aa = Smith 2014 (pers. comm.), ab = Tressler, 1937, ac = Würdig & Pinto 1990, ad = Victor & Fernando 1981).

Species	#	Country	Locality	Site characterisation	Original combination	Ref
Cypricercus inermis	1	South Africa	Witsieshoek, near Rydal Mount		*Tanycypris inermis*	q
	2	South Africa	Greytown		*Tanycypris inermis*	q
	3	South Africa	Greytown		*Cypris inermis*	a
	4	South Africa	Greytown		*Cypris inermis*	b
Diaphanocypris meridana	5	Guadeloupe	Iles des Saintes, Terre-de-Haut	temporary dug-out pool		c
	6	Venezuela	Isla Margarita	permanent, stagnant pool		c
	7	Guadeloupe	La Désirade	dug-out pool		c
	8	Venezuela	Los Testigos, Pozza des Morro de la Iguana	semi-permanent pool		c
	9	Puerto Rico	Laguna Cartagena	semi-permanent pool		c
	10	Mexico	Near Merida			h
	11	Argentina	Santa Fe, Madrejon don Felipe		*Herpetocypris bonettoi*/ *Tanycypris bonettoi*	c, f, o
	12	Mexico	Rio Grande do Sul state	floodplain		ac
	13	Mexico	States of Paraiba	pond		ac
	14	Mexico	Pernambuco	small canal		ac
	15	Mexico	Merida	pond		ac
	16	Argentina	Santa Fe	swamps		ac
	17	Brazil	Porto Rico, Parana Riva floodplain	22°46'55"S; 53°20'59"W		j
	18	South Africa	Weltevreden West Pan, Transvaal		*Dolerocypris sagitta*	m
	19	South Africa	Ayuden Mundo novo		*Dolerocypris sagitta*	m
	20	Cape Verde	Santa Luzia		*Dolerocapris sagitta*	m
	21	Brazil	Capoerias		*Dolerocypris sagitta*	m
	22	Argentina	Villa Maria		*Dolerocypris sagitta*	m
	23	Brazil	Apipucos		*Dolerocypris sagitta*	m
	24	Brazil	Olinda		*Dolerocypris sagitta*	m
	25	Panama	Pito		*Dolerocypris sagitta*	m
	26	Brazil	Rio Capivare		*Dolerocypris sagitta*	m
	27	Brazil	Rio Mandau		*Dolerocypris sagitta*	m
Diaphanocypris pedroensis	28	Brazil	Sao Pedro, South Ceara		*Strandesia pedroensis*	ab
	29	Argentina	Laguna de Buenos Aires		*Strandesia pedroensis*	x
Dolerocypris marina	30	Chile	Cabo Metaqui	42°16,5´S, 74°32,5´W	*Dolerocypris marina*	i

.....continued on the next page

TABLE 1. (Continued)

Species	#	Country	Locality	Site characterisation	Original combination	Ref
Herpetocypris telavivensis	31	Israel	Tel Aviv	pool of Wadi Mussararh	*Herpetocypris telavivensis*	n
	32	Israel	Tel Aviv		*Tanycypris telavivensis*	p
Nealecypris clavigera	33	Madagascar	Majunga		*Cypris clavigera*	t
	34	Africa	Batusoland	Hensley Dam	*Tanycypris clavigera*	c,q,y
Nealecypris obtusa	35	South Africa	Weltevreden West Pan		*Dolerocypris obtusa*	l
	36	South Africa	Weltevreden West Pan, near Lake Chrissie		*Tanycypris obtusa*	q
	37	South Africa		26°16′30′′S, 26°52′0′′E		z
Tanycypris alfonsi n.sp.	38	Japan				v
	39	Korea				aa
Tanycypris centa	40	China	Yangdong, Hygeongsan River	35°59′16′′N, 129°15′21′′E		e
Tanycypris madagascarensis	41	Madagascar	Majunga		*Cypris madagascarensis*	t
	42	Madagascar	Majunga			c
Tanycypris pellucida	43	Japan	Okayama	rice field	*Strandesia camaguinensis*	c,u
	44	Russia				c
	45	Sumatra	Pangururan	dam	*Dolerocypris pellucida*	k
	46	Philippines	Camaguin Island	roadside ditch, rice field	*Strandesia camaguinensis*	c,ab,ad
	47	Philippines	Calamba, Luzon	rice field		ad
	48	Malaysia	Perak	rice field		c,ad
	49	Malaysia	Sarawak	rice field		c,ad
	50	Uzbekistan	Chupan-aza, Samarkand	rice field		d
	51	Macedonia	Cesinovo	rice field		w
	52	Uzbekistan		rice field		w
	53	Tajikistan		rice field		w
	54	Italy	Arborio	dried mud		g
	55	Italy	Mapetta	dried mud		g
	56	Italy	Rosavenda	dried mud		g
	57	Italy	Parma	rice field		r
	58	Italy	Crete Senesi	rice field		s
	59	Italy	Lombardy	rice field		s
	60	Italy	Province Novara	rice field		s
Tanycypris siamensis	61	Thailand	Maejai district, Mapeum Reservoir	19°21′28,6′′N, 99°21′44,6′′E		aa
	62	Thailand	Muang district, Bung sifai lake	16°25′25,7′′N, 100°20′35,4′′E		aa
	63	Thailand	Konsam District, Nalao natural spring	16°3522′′N, 101°53′49,7′′E		aa

According to the current and historical classification, natural occurrences of the genus *Tanycypris* Triebel, 1959 have been reported from Asia (i.e., Korea, Thailand, Philippines, Indonesia, Japan), South America (Chile, Brazil) and Madagascar (Tab. 1, Fig. 1). However, the genus has also been found in Southern European rice fields (Italy & Macedonia, Petkovski 1964; Moroni 1967; Rossi *et al.* 2003), most probably introduced with rice plants. The discovery of a new species of *Tanycypris* living amongst various exotic water plants in a greenhouse of the

Munich botanical garden (*Tanycypris alfonsi* n. sp.) made the present generic revision necessary, leading to an updated identification key to the species of the genus *Tanycypris*.

Currently, the genus *Tanycypris* includes nine species: *Tanycypris camaguinensis* (Tressler, 1937), *Tanycypris centa* (Chang *et al.*, 2012), *Tanycypris clavigera* (G.W. Müller, 1898), *Tanycypris madagascarensis* (G.W. Müller, 1898), *Tanycypris marina* (Hartmann, 1965), *Tanycypris pedroensis* (Tressler, 1950), *Tanycypris pellucida* (Klie, 1932), *Tanycypris siamensis* (Savatenalinton & Martens, 2009a) and *Tanycypris telavivensis* (Krampner, 1928) (Savatenalinton & Martens 2011; Chang *et al.* 2012).

Since most descriptions of the tribe Nealecyprididni do not consider all taxonomically relevant characters, the following species had to be reexamined: *Cypricercus inermis* (Brady, 1904), *Diaphanocypris meridana* (Furtos, 1936), *Dolerocypris sagitta* Klie, 1939, *Herpetocypris bonettoi* Ferguson, 1967, *Nealecypris obtusa* (Klie, 1933), *Tanycypris camaguinensis* Tressler, 1937, *Tanycypris centa* Chang *et al.*, 2012, *Tanycypris clavigera* (Müller, 1898), *Tanycypris madagascarensis* (Müller, 1898), *Tanycypris marina* (Hartmann, 1965), *Tanycypris pellucida* (Klie, 1932), *Tanycypris siamensis* Savatenalinton & Martens, 2009a, *Tanycypris telavivensis* (Krampner, 1928), *Strandesia pedroensis* Tressler, 1950.

Material and Methods

Material

This revision is mainly based on investigations of collection material; in many cases, type material was available. The Zoologisches Museum Hamburg (Germany) provided a syntype of *Nealecypris obtusa* Klie, 1932 (slide CR—1071), three syntypes of *Tanycypris pellucida* Klie, 1933 (one slide CR—1070a and one tube with two specimens in glycerine and ethanol CR—1070) and two syntypes of *Dolerocypris sagitta* Klie, 1933 (slides 1073a and 1509). The paratype of *Dolerocypris marina* Hartmann, 1965, expected to be found dissected in glycerine in tube K—27603, was not present and must be considered lost.

The National Museum of Natural History, Smithsonian Institution (Washington D.C., USA) provided all *Strandesia*-holotypes of Tressler on slides: *S. calapanensis* Tressler, 1937 (No. 71511); *S. camaguinensis* Tressler, 1950 (No. 71512); *S. balensis* Tressler, 1937 (No. 71514); S. *pedroensis* Tressler, 1950 (No. 83008); *S. ovalis* Tressler, 1950 (No. 83028); *S. itapeva* Tressler 1950 (No. 83029); *S. riograndensis* Tressler, 1950 (No. 83030); *S. tietensis* Tressler, 1950 (No. 83031); *S. denticulata* Tressler, 1950 (No. 83032). However, for the present study, only the types of *S. camaguinensis* and *S. pedroensis* proved to be relevant, due to their meanwhile treating as *Tanycypris*. The Zoologisches Institut und Museum Greifswald (Germany) provided the holotype of *Tanycypris madagascarensis* G.W. Müller, 1898 [Cat II, No. 24626 (32a)] and four paratypes on slides and two paratypes, which we dissected, one on a slide, the other for scanning electron microscopy (SEM). Further, it provided three paratypes of *Tanycypris clavigera* G.W. Müller, 1898 (32e); the holotype is not present in this collection. During a visit to the Senckenberg Institution (Frankfurt, Germany), slides of syntypes of *Tanycypris madagascarensis* dissected by Triebel could be investigated. Specimens of *Nealecypris obtusa* Klie, 1933 from Thailand were provided by Prof. Dr. Koen Martens, Brussels, Belgium. Specimens of *Tanycypris siamensis* Savatenalinton & Martens, 2009a from Thailand were provided by Dr. Sukonthip Savatenalinton, Mahasarakham, Thailand. Dr. Trajan Petkovski (Skopje, Macedonia) provided specimens of *Tanycypris pellucida* collected in 1966 in Macedonia.

Specimens of *T. alfonsi* n. sp. and *T. centa* were collected by the authors in a greenhouse of the Munich Botanical Garden, Germany. The ca 1 m^2 large containers accommodate non-native hydrophytes growing on partly sandy and muddy sediment in 1–10 cm depths of water. The samples were taken by sieving sediment (mesh width 250 μm^2) or pipetted by hand directly from the containers. In the laboratory, the living specimens were transferred to 70% ethanol.

The type material of the new species is deposited in the Zoologische Staatssammlung München (Germany) (No. ZSMA20130101–20130107).

Methods

For the drawings of significant characters and their analysis, transmission light microscopy (TLM), fluorescence microscopy (FM) and scanning electron microscopy (SEM) were used.

For TLM, specimens were dissected in Hydro-Matrix® mounting media (Micro-Tech-Lab). Images were taken with a Leica DFC 480—camera attached to a Leica DMLB2 transmission light microscope. Valves were stored dry in micropalaeontological cavity slides.

For SEM, adult specimens of *T. alfonsi* n. sp. and *T. centa* were fixed and dissected in 70% ethanol, dehydrated, critical point dried (BalTec CPD 030) and coated with gold (Polaron Sputter Coater). The specimens were then studied using a SEM (Leo 1430 VP).

Drawings of morphological characteristics were made with the aid of camera lucida, fitted to a transmission light microscope (Wild 121236). Drawings were scanned and electronically tracked using a graphic tablet (Cintiq 12 WX, Wacom), an electronic pen (Wacom Inkling MDP—123), and the software Adobe Creative Suite 4, according to the protocol of Coleman (2003). Drawings were finally optimized in Adobe Illustrator while comparing directly to the microscopic images. The Index and Bibliography of Nonmarine Ostracoda (Kempf 1980–2006) was consulted during taxonomical work. Non-taxonomical signs in annotated synonymy lists have been used according to the guidelines by Richter (1948), which were translated to English, and recommended by Matthews (1973).

Abbreviations
LV=left valve; RV=right valve; H=height of valves; L=length of valves; W=width of carapace; A1=first antenna; A2=second antenna; Md=mandibula; Mx=maxilulla; T1=first thoracopod; T2=second thoracopod; T3=third thoracopod; CR=caudal ramus; db=dorsal branch; vb=ventral branch.

Abbreviations of collections:
SGN=Senckenberg Gesellschaft für Naturforschung (Frankfurt, Germany); NMNH=National Museum of Natural History, Smithsonian Institution (Washington D.C., USA); ZMG=Zoologisches Institut und Museum Greifswald (Greifswald, Germany); ZMH=Zoologisches Museum Hamburg (Hamburg, Germany); ZMK=Zoologisches Museum der Universität Kiel (Kiel, Germany) (ostracods as permanent loan in ZMH); ZSM= Zoologische Staatssammlung München (München, Germany).

Chaetotaxy of the appendages follows the model proposed by Broodbakker & Danielopol (1982), Martens (1987) and Meisch (2000).

Results

Taxonomy

Class Ostracoda Latreille, 1802
Subclass Podocopa Sars, 1866
Order Podocopida Sars, 1866
Suborder Podocopina Sars, 1866
Superfamily Cypridoidea Baird, 1845
Family Cyprididae Baird, 1845
Subfamily Cypricercinae McKenzie, 1971

Tribe Nealecypridini Savatenalinton & Martens, 2009

The Tribe Nealecypridini includes the genera *Astenocypris* G. W. Müller, 1912, *Diaphanocypris* Würdig & Pinto, 1990, *Nealecypris* Savatenalinton & Martens, 2009 and *Tanycypris* Triebel, 1959. These species differ from other Cypricercinae-tribes by a narrow carapace in dorsal view, a Triebel loop either without vb or with a short vb, located in the middle of the distal CR attachment (Savatenalinton & Martens 2009a).

The four species of the tribe Nealecypridini can be differentiated using characters of T1, T2, CR attachment and LV (Tab.2)

TABLE 2. Differential diagnosis of the genera of the tribe Nealecypridini (after Savatenalinton & Martens 2009a)

Genus	*Tanycypris*	*Diaphanocypris*	*Nealecypris*	*Astenocypris*
Body region				
T1	With b- and d-seta	Without b- and without d-seta	With b- and without d-seta	Without b- and with d-seta
T2	d1>d2	Without d1, without d2	Large d1, short & slim d2	d1> d2
CR-attachment	Short, stout vb	Without vb	Without vb	With short vb and short, pointed db
Anterior part of internal LV	Groove, no inner list	No groove, no inner list	No groove, no inner list	No groove, no inner list

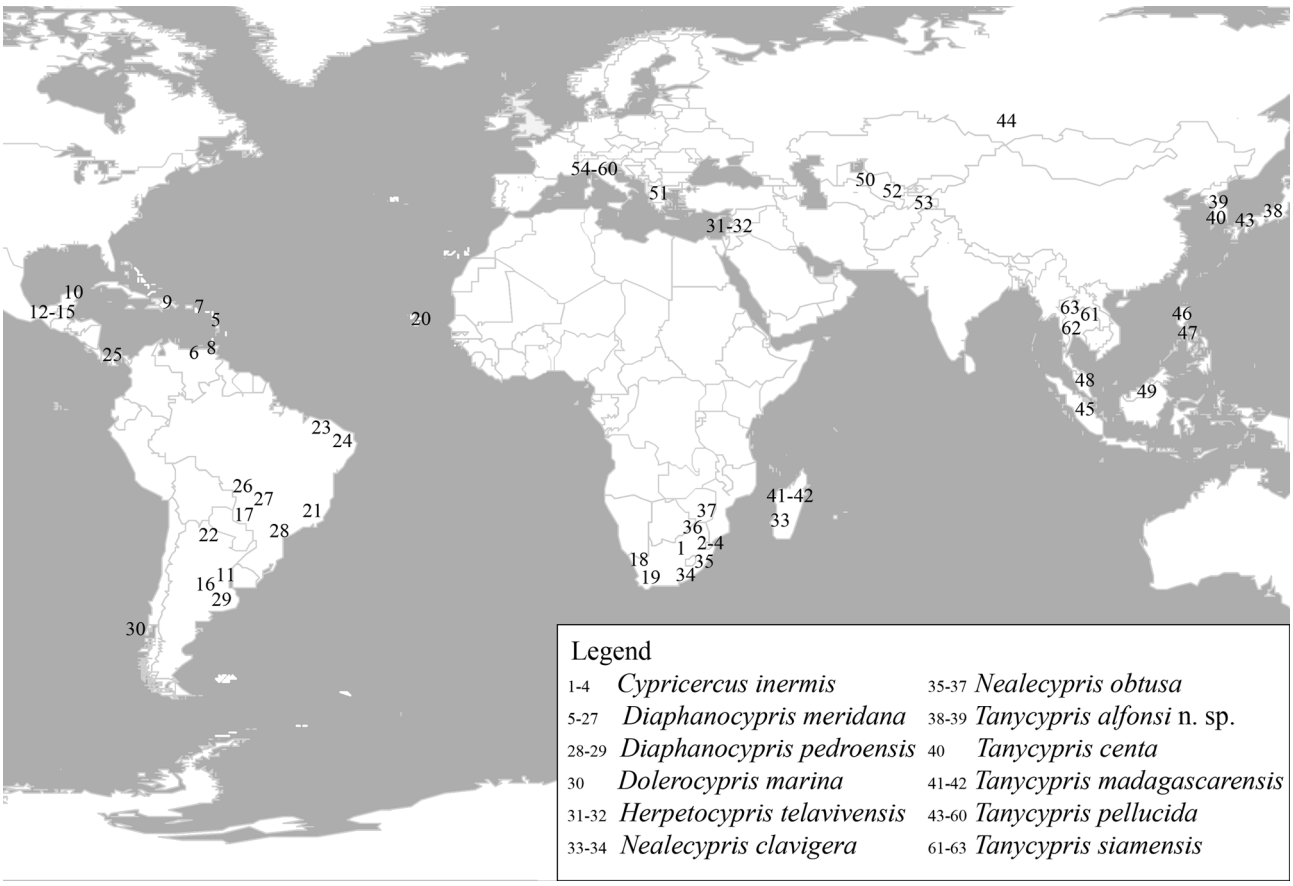

FIGURE 1. Geographic occurrences of ostracod species covered by this study.

Genus *Tanycypris* Triebel, 1959

Type species *T. madagascarensis* (Müller, 1898)

Diagnosis. Carapace elongated. Height less than half the length. Carapace in dorsal view narrow. Width smaller than height. LV overlaps RV. Anterior margin more broadened than posterior margin. Dorsal and ventral margin almost straight. Anterior part of the inner lamella with a groove, but without an inner list. T1 with two a-setae, one b-seta and one d-seta. T2 with d1 longer than d2. CR symmetric, long (two-third of the length of the valves), claws strongly serrated. CR-attachment with Triebel loop at the middle, vb short, stout or pointed, db well developed (Müller 1898, Triebel 1959, Victor & Fernando 1981, Savatenalinton & Martens 2009a).

***Tanycypris alfonsi* n. sp.**
(Figs 2–4)

2004 *Tanycypris pellucida* (Klie)—Okubo: 57. 18 a, b, l–n.

Material examined 30 females from a container in the greenhouse of the Botanical Garden, Munich, Germany. Sampled in March 2011, deposited at the Zoologische Staatssammlung München.
Type material: Holotype—dissected female on glass slide and valves stored dry in micropalaeontological slides (ZSMA20130101). Paratypes—dissected females (ZSMA20130102, ZSMA20130103, ZSMA20130104, ZSMA20130105), whole female (ZSMA20130106), female valves (ZSMA20130103, ZSMA20130107).

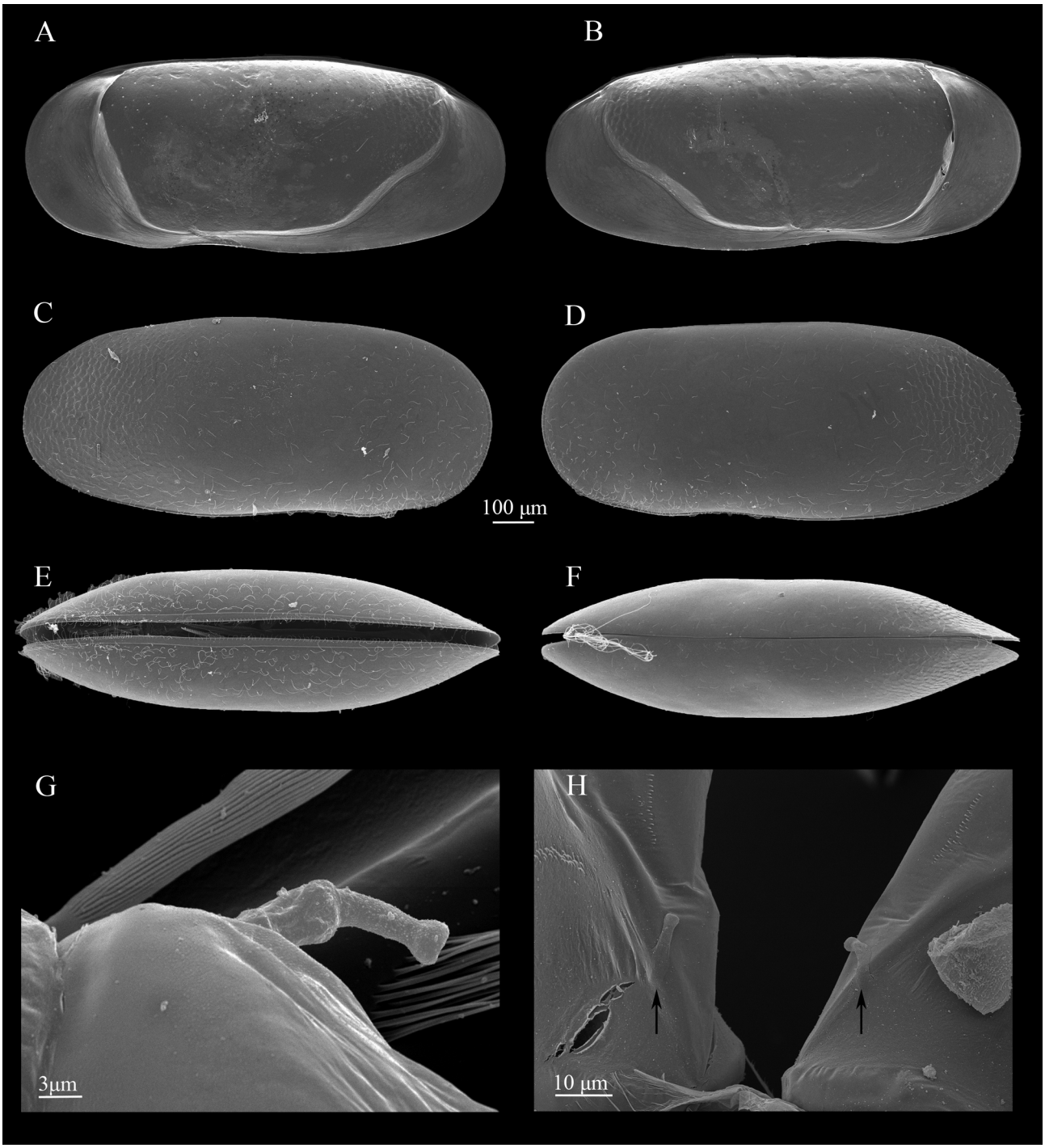

FIGURE 2. *Tanycypris alfonsi* n.sp. A, RV interior view; B, LV interior view; C, RV exterior view; D, LV exterior view; E, Carapace in ventral view; F, Carapace in dorsal view; G, Rome organ; H, Wouters organ.

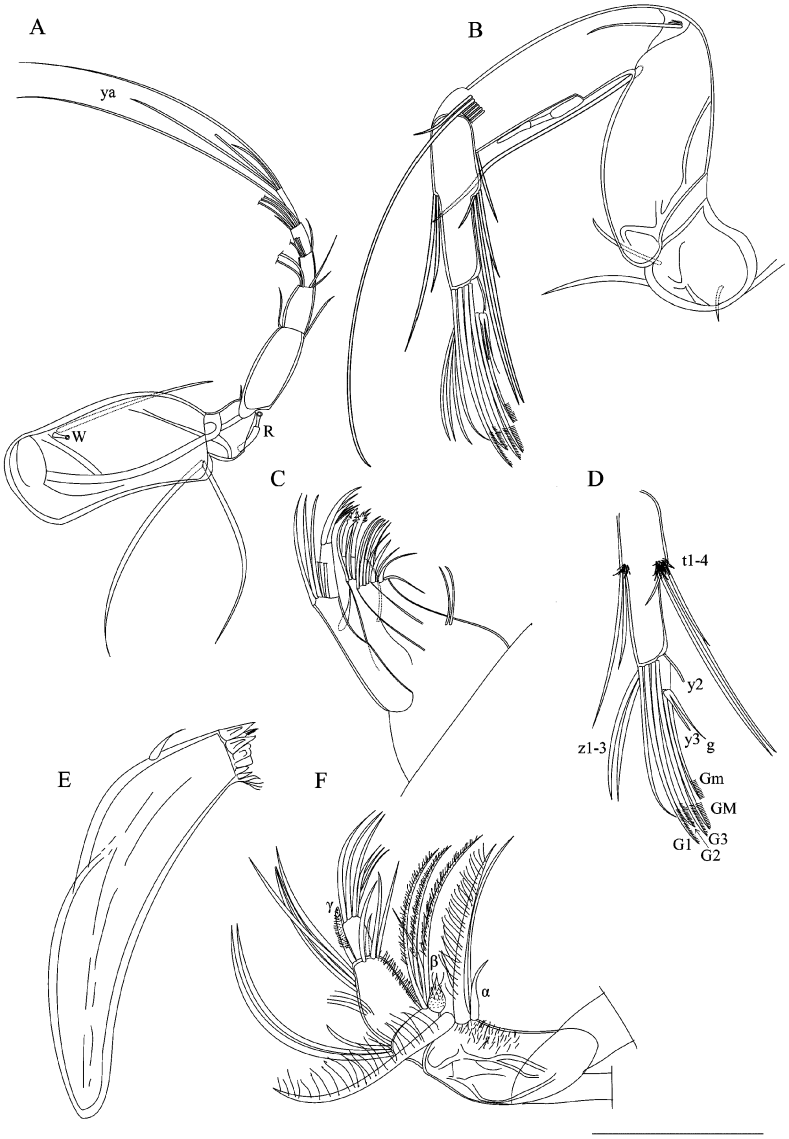

FIGURE 3. *Tanycypris alfonsi* n. sp. (ZSMA 20130101). A, An1; B, An2; C, Mx; D, An2-Detail; E, Md; F, Md palp. Scale bar = 100 μm for A–F.

Type locality: Botanical Garden, Munich, Germany (48°9'49.22"N, 11°30'6.96"E).

Etymology: The new species *Tanycypris alfonsi* is named after the first author's grandfather, Alfons Nagengast, who passed away the month of the discovery of this new species.

Diagnosis. Carapace elongate, with length-height ratio of 2.7, maximum height at anterior quarter. Calcified inner lamella very wide with slight inward bulge in postero-ventral region. Carapace with a roof tile-like structure in the anterior region. Antennula with small Wouters and big Rome organ, both swollen apically. Caudal rami long and symmetric. Attachment of the caudal rami solid.

Description of female. Carapace (Fig. 2A–F) length 1.09–1.27 mm, height 0.39–0.53 mm (N = 25), in lateral view elongated with a length:height ratio of 2.7 (2.4–3.1) with maximum height at the anterior quarter. In dorsal view spindle shaped with maximum width approximately at midlength. Anterior and posterior ends rounded. Surface of valves with roof tile-like structure in the anterior region. Carapace in dorsal view narrow. Colour light green. LV in interior view (Fig. 2B) with a groove along anterior and ventral margin. Dorsal margin almost straight. Ventral margin slightly sinuous in the first third. Inner lamella without inner list, anteriorly and posteriorly broad with a sinuously formed enlargement. RV in interior view (Fig. 2A) without groove. Dorsal margin relatively straight, ventral margin slightly sinuous, inner lamella as in LV. Fused zone very narrow, with small marginal pore

canals. Mandibular scars and adductor scars weak. A1 (Fig. 3A) with eight segments, first two of which fused together forming a large, elongate base. First segment with small, inconspicuous Wouters organ (Fig. 2H) and one long dorsal subapical seta. Second segment with two long ventro-distal setae. Third segment with big Rome organ (Fig. 2G) and with one very short dorso-apical seta. Fourth segment with one short dorso-distal seta and one short ventro-distal seta, reaching the end of the fifth segment. Fifth segment with two long dorso-distal setae and two short ventro-distal setae. Sixth segment with one short, one medium, and two long apical setae. Seventh segment with four long and one very short apical setae. Terminal segment with one long, one medium and one short seta and aesthetasc y_a.

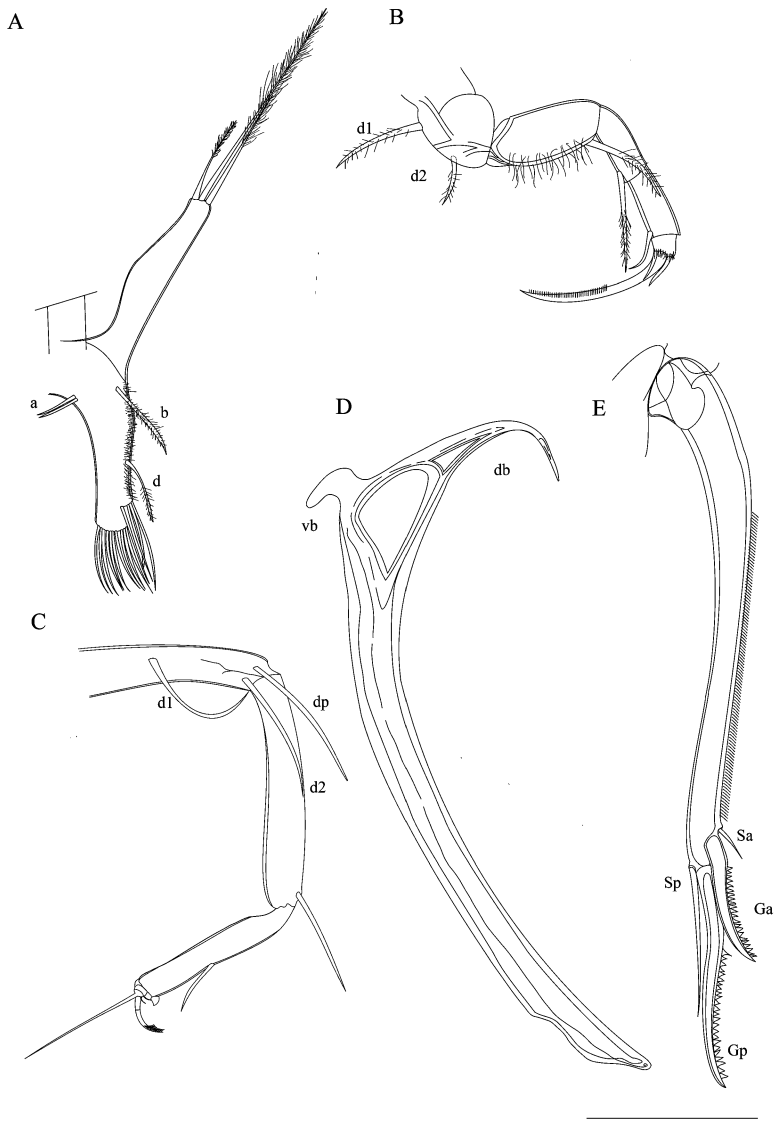

FIGURE 4. *Tanycypris alfonsi* n. sp. (ZSMA 20130101). A, T1; B, T2; C, T3; D, CR attachment; E, CR. Scale bar = 100 µm for A–F.

Coxa of A2 with three unequal setae. Base with very long ventro-apical seta. Exopod with one long and two very short setae. Endopod: first segment with a long aesthetasc Y and a medium-length ventro-distal seta. Natatory setae reaching to the distal end of claws. Second segment with four medio-ventral t-setae and two medio-dorsal unequal setae, distally with three serrated claws G1, G2, G3 (G2 the shortest), three long z-setae and a short, ventral aesthetasc y_2. Third segment with long claw GM and slightly shorter claw Gm, both serrated, g-seta and aesthetasc y_3, reaching to the first third of claw Gm (Fig. 3B, D).

Md (Fig. 3E) coxa with six teeth on endite and one subapical short seta. Md palp (Fig. 3F) elongate. First

segment with a long smooth α-seta, one long seta and two long setae with setules. Second segment ventrally with a wide, cone-shape, plumose β-seta, three long setae with setules, and one medium-length smooth seta. Dorsally with two long and one medium-length seta. Third segment with a group of four long dorsal setae, a dorso-distal slender γ-seta with setules and a ventro-distal group of four medium-length, smooth setae. Terminal segment with three setae and three claws. Branchial plate with five rays.

Mx (Fig. 3C) with two-segmented palp, three endites and branchial plate. First palp segment with five apical setae and one subapical seta. Second segment elongated with three claws and three setae. Third endite with two large, serrated tooth-bristles and two smooth setae. Branchial plate with twenty rays dorsally and six rays ventrally.

T1 (Fig. 4A) large and elongate with two a-setae, one b- and one d-setae. Endite with fourteen apical setae. The long endopodite with three unequal apical setae with setules on the distal end.

T2 (Fig. 4B) with five segments. The first segment with a d1 seta and a d2 seta. Seta d1 longer than d2. Second segment with a long, stout, apical e seta. Third segment with a long, stout, f seta. The fourth segment with curved g seta. The final segment with two, short h1 and h3 seta and a long, curved, serrated claw h2.

T3 (Fig. 4C) with four segments. First segment with medium-length d1, d2 and dp setae. Second segment with e seta. Third segment with f seta in the middle. Terminal segment forming compact pincer organ with a long h3 seta and a short, curved h2 seta.

CR (Fig. 4E) long, stout, and ventrally serrated. The ventral Gp claw half the length of Ga claw. Both strongly serrated. Sa seta three-quarters the length of Ga. Sp seta long and acuminate. Right and left caudal ramus symmetric. Transition zone between CR and CR attachment very broad and compact. CR attachment (Fig. 4D) a stout, arcuate stem with triangular Triebel loop distally. Dorsal branch db very thin and strongly curved with a slim end. Ventral branch vb wide, short and rounded in outline.

Similar species. *Tanycypris alfonsi* n. sp. comes close to *T. pellucida* Klie, 1932, but differs from it in the configuration of the setae at T1. *T. alfonsi* n. sp. has two a-setae, one b-seta, and one d-seta, while *T. pellucida* has two a-setae, two b-setae, one c-seta and one d-seta. The species also differ in the roof tile-like structure in the anterior region of the carapace (present in *T. alfonsi* n. sp., weak in *T. pellucida*) and *T. alfonsi* n. sp. has a much wider calcified inner lamella than *T. pellucida.*

Remarks. Males unknown. A mode of locomotion previously unknown in ostracods has recently been described for *T. alfonsi* as well as for *T. centa* (Matzke-Karasz *et al.* in press). In these species, jumps of exceptional high speed have been observed and analysed by high-speed camera recordings.

Tanycypris centa (Chang *et al.*, 2012)

(Figs 5A, 6D, 6I, 7C)

Diagnosis. L = 1.10–1.14 mm, H = 0.45–0.47 mm; maximum height at the anterior quarter. Carapace in dorsal view narrow, in lateral view elongated. Inner lamella broad with slight concavity in postero-ventral region. Carapace with large purple patches. A1 with Wouters and Rome organ (Fig. 5A). T1 elongated with two a-setae, with b-seta and with d-seta. Masticatory process of T1 with 12 setae (Fig. 6I). T2 with longer d1 than d2. CR relatively long, almost straight, Sp plumose (Fig. 6D). CR attachment stout, relatively short and slim, with db strongly bent, vb thin and curved (Fig. 7C). Males unknown (Chang *et al.* 2012).

Similar species. *Tanycypris centa* can be mistaken for *Tanycypris siamensis, Tanycypris alfonsi* n. sp. and *Tanycypris pellucida. T. centa* possesses a straighter dorsal margin and a narrower curved posterior margin than *T. siamensis* (subequally curved in the latter) and a differently shaped inner margin. The CR is thinner than in *T. siamensis*. The carapace is set with purple patches in *T. centa*, while *T. siamensis* is consistently brownish-yellow (Chang *et al.* 2012).

T. centa differs from *T. pellucida* in the lack of a second b-seta on T1 (*T. pellucida*: T1 with two b-setae), a much wider calcified inner lamella in *T. centa* and in the lack of a dorsal subapical seta on the first segment of A1 (present in *T. pellucida*). *T. centa* differs from *T. alfonsi* n. sp. in the carapace coloration (*T. alfonsi* n. sp. is light green), in the lack of a roof tile-like structure in the anterior region of the carapace (present in *T. alfonsi* n. sp.), in a more ovoid shape in dorsal view (narrower in *T. alfonsi* n. sp.) and in the lack of a long dorsal subapical seta on the first segment of A1 (present in *T. alfonsi* n.sp.).

Remarks. Chang *et al.* (2012) described *Tanycypris centa* from Korea and deposited the material in the

National Institute of Biological Resources, Incheon, Korea (No. NIBRIV 0000243259–0000243262) and in the Department of Biological Science, Daegu University, Korea (No. DB 40011–40028). For the present study, specimens sampled in the Botanical Garden Munich have been investigated.

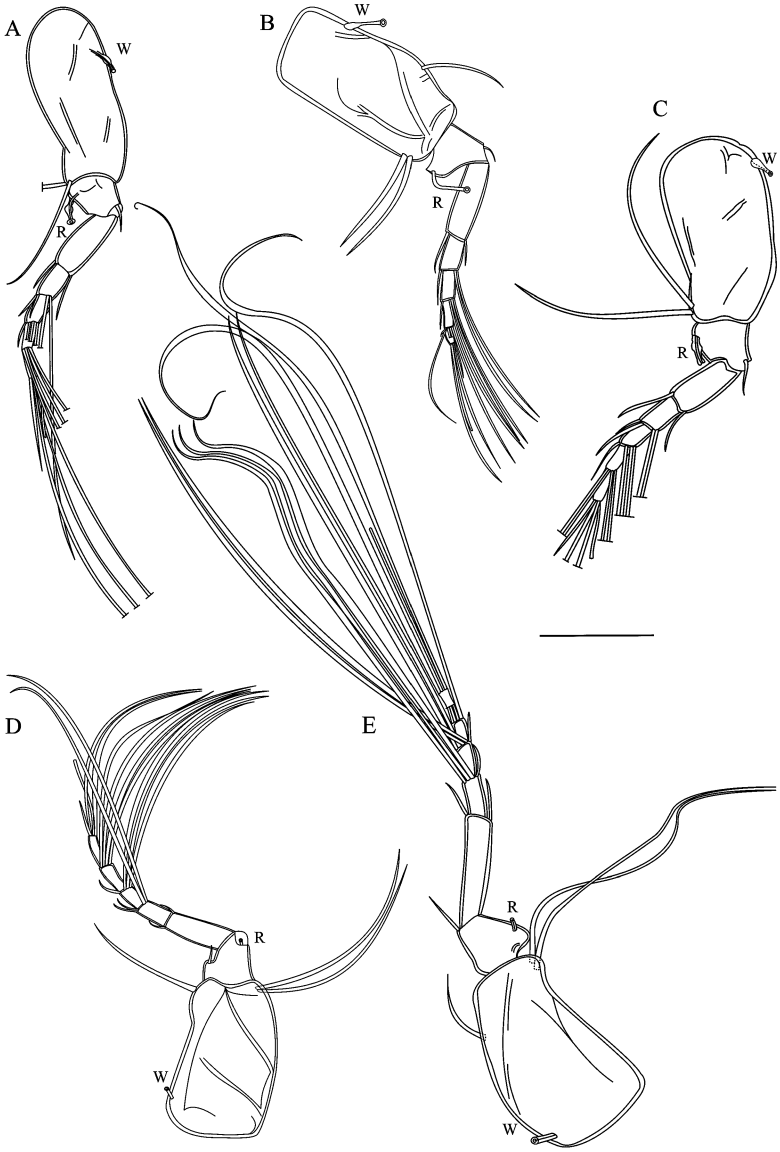

FIGURE 5. First antennae. A, *Tanycypris centa* (after Chang *et al.* 2012); B, *T. pellucida*; C, *T. siamensis* (after Savatenalinton & Martens 2009a); D, *N. obtusa*; E, *T. madagascarensis*. Scale bar = 100 μm for A–E.

Tanycypris madagascarensis (G. W. Müller, 1898)

(Figs 5E, 6E, 6J, 7B, 8)

* v 1898 *Cypris madagascarensis* G. W. Müller: 271–273, pl. 16, 7–13.
1912 *Dolerocypris madagascarensis*—G.W. Müller: 193.
v 1959 *Tanycypris madagascarensis*—Triebel: 167–169, pl. 16, 19a. pl. 17, 19b–21. pl. 18, 24–28.

Diagnosis. L = 1.42–1.66 mm, H = 0.57–0.66 mm; greatest width in the middle. Females 0.1 mm longer than males on average. Carapace in dorsal view narrow. Valves asymmetric. RV smaller than LV, LV with an obtuse angle at the joining of the posterior and ventral margin (Fig. 8A, B) Dorsal margin weakly arched; ventral margin slightly concave. A1 with Wouters organ and Rome organ and with extremely long setae on the fifth, sixth, seventh and eighth segment (Fig. 5E). T1 with b and d seta, asymmetric in males (Fig. 6J). T2 with very long and strong d,

and thin, small d2. CR stoutly built, weakly bent; setules gradually decreasing in length from distal to proximal; Sp very long in relation to the Sp of other *Tanycypris* species (Fig. 6E). Trunk of CR attachment as wide as trunk of CR; cone-like, short vb, slim, sinuous db (Fig. 7B). Male hemipenis with a deep incisure in the lateral shield. Zenker organ with 30 rosettes of chitinous rays (Müller 1898; Triebel 1959).

History. Müller (1898) described *Cypris madagascarensis* from Majunga, Madagascar, and deposited the holotype [Cat II, No. 24626 (32a)] and several paratypes in the ZMG. Later, he transferred the species to *Dolerocypris* (Müller 1912). Triebel (1959), when erecting the genus *Tanycypris*, designated *Tanycypris madagascarensis* as type species.

Similar species. *Tanycypris madagascarensis* is the largest species of the genus and has a characteristic posterior-ventral angle in the LV. It has a characteristic db on the CR attachment. The Sp on the CR is relatively long and all appendages are strongly built. The setae on all appendages are relatively long. This species cannot be mistaken for other species of the genus *Tanycypris.*

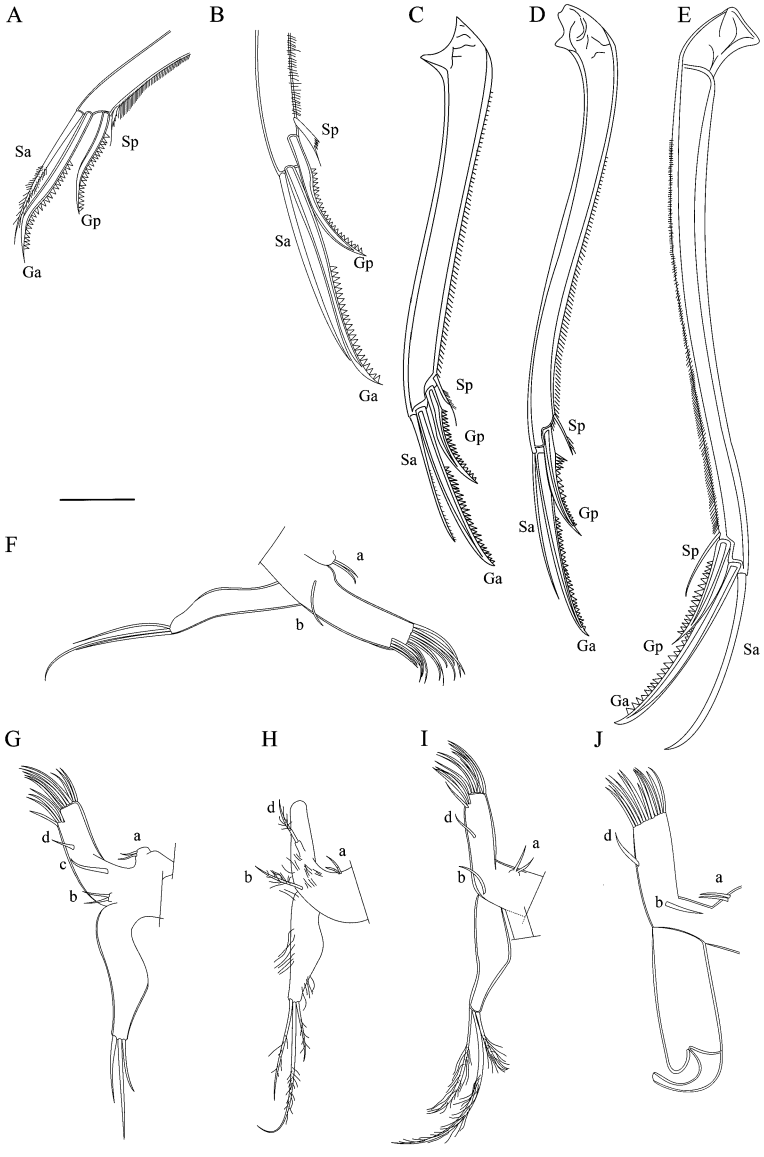

FIGURE 6. Caudal rami and first thoracopod. A, CR *Nealecypris obtusa*; B, CR *Tanycypris pellucida*; C, CR *T. siamensis* (after Savatenalinton & Martens 2009a); D, CR *T. centa*; E, CR *T. madagascarensis*; F, T1 (female) *N. obtusa*; G, T1 (female) *T. pellucida*; H, T1 (female) *T. siamensis* (after Savatenalinton & Martens 2009a); I, T1 (female) *T. centa* (after Chang *et al.* 2012); J, T1 (male) *T. madagascarensis*. Scale bar = 100 µm for A–J.

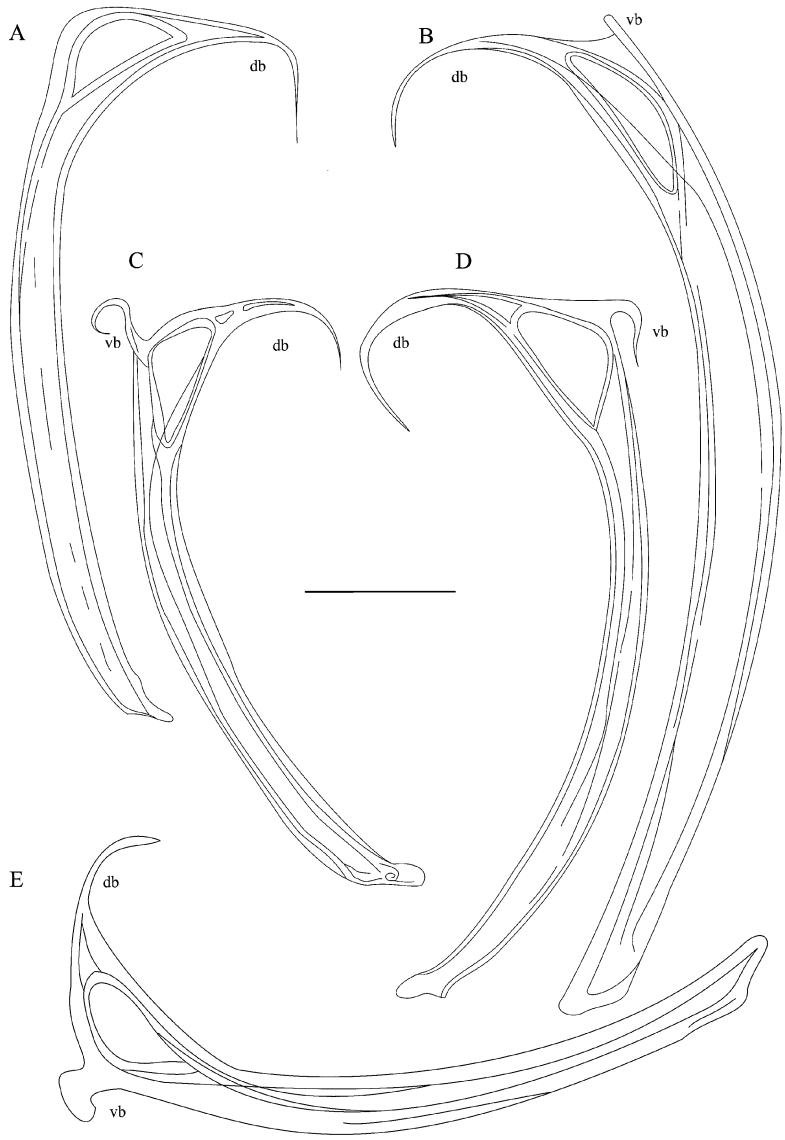

FIGURE 7. Caudal ramus attachments. A, *Nealecypris obtusa*; B, *Tanycypris madagascarensis*; C, *T. centa*; D, *T. pellucida*; E, *T. siamensis* (after Savatenalinton & Martens 2009a). Scale bar = 100 µm for A–E.

Tanycypris pellucida (Klie, 1932)

(Figs 5B, 6B, 6G, 7D, 9)

v *	1932 *Dolerocypris pellucida* Klie: 482–483, figs 63–65.
	1947 *Dolerocypris pellucida*—Bronshtein: 165, fig. 58, 1–2.
	1964 *Dolerocypris pellucida*—Petkovski: 166, figs 51–52.
partim	1972 *Strandesia camaguinensis* (Tressler)—Okubo: 10, fig. 1 d–r.
v	1981 *Strandesia camaguinensis* (Tressler)—Victor & Fernando: 114–116.
	1981 *Tanycypris pellucida*—Victor & Fernando: 114–116.
	1984 *Tanycypris pellucida*—Broodbakker: 16, 18, 21–23.
	2004 *Strandesia camaguinensis* (Tressler)—Okubo: 57, fig. 18a,b,l-n.

Diagnosis. L = 1.36–1.46 mm, H = 0.53–0.63 mm, W = 0.34–0.42 mm; greatest width in anterior to the middle. Carapace in dorsal view lanceolate, in lateral view elongated. Valves transparent, thin, indistinctly pigmented, yellowish-green. Posterior area with roof-tile like structure (Fig. 9A). Dorsal margin almost straight, ventral margin slightly concave. Inner lamella in anterior and posterior region wide (Fig. 9B). Anterior and posterior margin rounded.

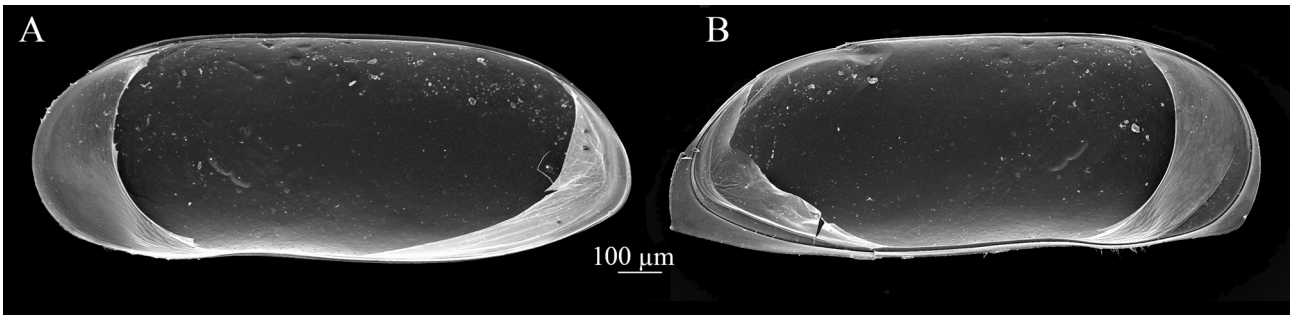

FIGURE 8. Internal views of valves of *Tanycypris madagascarensis* (SEM). A, right valve; B, left valve.

A1 with Wouters organ, with a dorsal subapical seta on the first segment of A1 and with Rome organ on the third segment of A1 (Fig. 5B).

T1 with two a-setae, two b-setae, c-seta and d-seta (Fig. 6G, 9C).

T2 with longer d1 than d2.

CR (Fig. 6B). CR attachment relatively thin, slightly curved with a long, strong db and a short, stout, curved vb (Fig. 7D) (Klie 1932; Tressler 1937; Bronshtein 1947; Petkovski 1964; Okubo 1972; Victor & Fernando 1981; Broodbakker 1984).

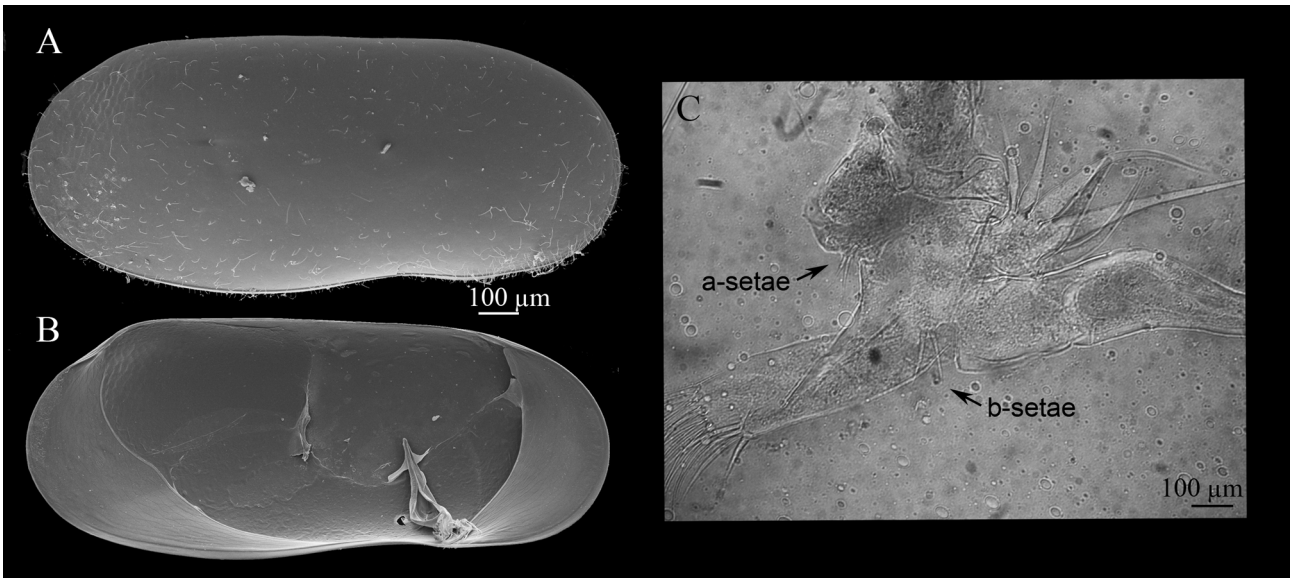

FIGURE 9. *Tanycypris pellucida*. A, right valve external view (SEM); B, left valve internal view (SEM); C, T1 (light microscope).

History. Klie (1932) described *Dolerocypris pellucida* and deposited the material (No. CR—1071) in the collection of the ZMK. Bronshtein (1947) found *D. pellucida* in samples from rice-fields of Chuppanata (Kazakhstan) and referred to the description of Klie (1932). Petkovski (1964) reported *D. pellucida* from rice-fields in Macedonia. Victor & Fernando (1981) synonymized *Dolerocypris pellucida* (Klie, 1932) with *Strandesia camaguinensis* (Tressler, 1937) and *Strandesia camaguinensis* sensu Okubo 1972. They transferred *Dolerocypris pellucida* to *Tanycypris*—a view that was followed by Broodbakker (1984).

Tressler (1937) described *Strandesia camaguinensis* based on material from a ditch in Camaguin Island and deposited the holotype (No. 71512) in the NMNH; however, the valve characters cannot be reliably studied because the valves have been embedded together with the dissected appendages. The valves are therefore compressed and partly broken.

Okubo's (1972) *Strandesia camaguinensis* from Okayama is dubious. The valves in Okubo (1972: fig. 1a–c) show a much higher congruence with those of *T. siamensis* Savatenalinton & Martens (Savatenalinton & Martens 2009a: fig. 8A) than with Tressler's drawings of *Strandesia camaguinensis* (= *Tanycypris pellucida* Klie 1932). On the other hand, the appendages in Okubo (1972) seem to originate from *Strandesia camaguinensis* (diagram and description of the CR and the CR attachment). Possibly, Okubo illustrated the valves from material he found in Okayama (= *Tanycypris siamensis*) and the appendages of *Strandesia camaguinensis* (= *Tanycypris pellucida*). Chang *et al.* (2012), already considered the valves Okubo illustrated to belong to *T. siamensis* rather than to *T. pellucida* ("Okubo's [species] more closely resemble *T. siamensis* rather than Klie's original description of *T. pellucida*, which has much narrower calcified inner lamellae" (Chang *et al.* 2012: 8)). The view of Chang *et al.* (2012) is fully supported by our study.

Similar species. *Tanycypris pellucida* can be mistaken for *T. alfonsi* n. sp. and for *T. siamensis* (see *T. alfonsi* n. sp.). *Tanycypris pellucida* differs from *T. siamensis* in the presence of two b-setae, and one c-seta on T1 (one b-seta, no c-seta in *T. siamensis*) and in the presence of a dorsal subapical seta on the first segment of A1 (absent in *T. siamensis*).

Remarks. After re-examination of the holotypes of *Tanycypris pellucida* and *Strandesia camaguinensis*, we agree with Victor & Fernando (1981) that *Strandesia camaguinensis* Tressler, 1937 is a junior synonym of *Tanycypris pellucida* (Klie, 1932).

Tanycypris siamensis Savatenalinton & Martens, 2009a

(Figs 5C, 6C, 6H, 7E, 10)

partim 1972 *Strandesia camaguinensis* (Tressler)—Okubo: 10, fig. 1 a–c.

Diagnosis. L = 1.02–1.15 mm, H = 0.45–0.52 mm; carapace in dorsal view narrow, in lateral view elongated with subequally rounded anterior and posterior margin. Surface of valves relatively smooth with a brown-yellowish colour. A1 with big Wouters organ (Fig. 10A,B), but without a dorsal subapical seta on the first segment. Long Rome organ present (Figs 5C, 10A). T1 with two a-setae, one b-seta and one d-seta, masticatory process with 14 setae (Fig. 6H). T2 with d1 longer than d2. CR stout with a hirsute Sp (Fig. 6C). CR-attachment very stout with a strong, curved db and a thick and short vb (Fig.7E). Males have been reported (Savatenalinton 2011), but so far no description has been published.

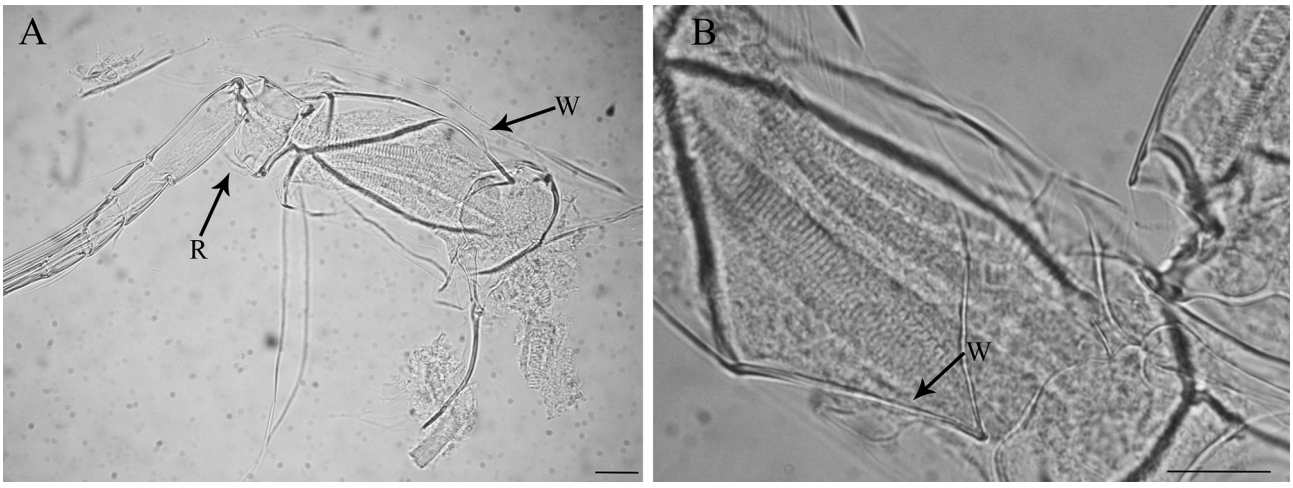

FIGURE 10. *Tanycypris siamensis* (light microscope). A, A1 with Wouters and Rome organ; B, detail of Wouters organ. Scale bar = 10 μm for A–B.

Similar species. Owing to the carapace shape, *T. siamensis* cannot be mistaken for *T. madagascarensis.* For similarities with *T. alfonsi* n. sp., *T. centa* and *T. pellucida* see descriptions of these species.

Remarks. Savatenalinton & Martens (2009a) described *Tanycypris siamensis* from Thailand and deposited the holotype (No. 3099) and one paratype (No. 3100) in the ostracod collection of the Royal Belgian Institute of Natural Sciences. Two paratypes (MSU-ZOC 018—019) are deposited in the Natural History Museum Mahasarakham in Thailand. While the type material has not been studied, five specimens provided by the authors of the species have been investigated in the frame of the present study.

According to Savatenalinton & Martens (2009a) *T. siamensis* has no or an inconsiderable Wouters organ. However, the material investigated in the frame of this study showed a clearly visible Wouters organ (one fourth of the length of segment 1 + 2) (Fig. 10A,B).

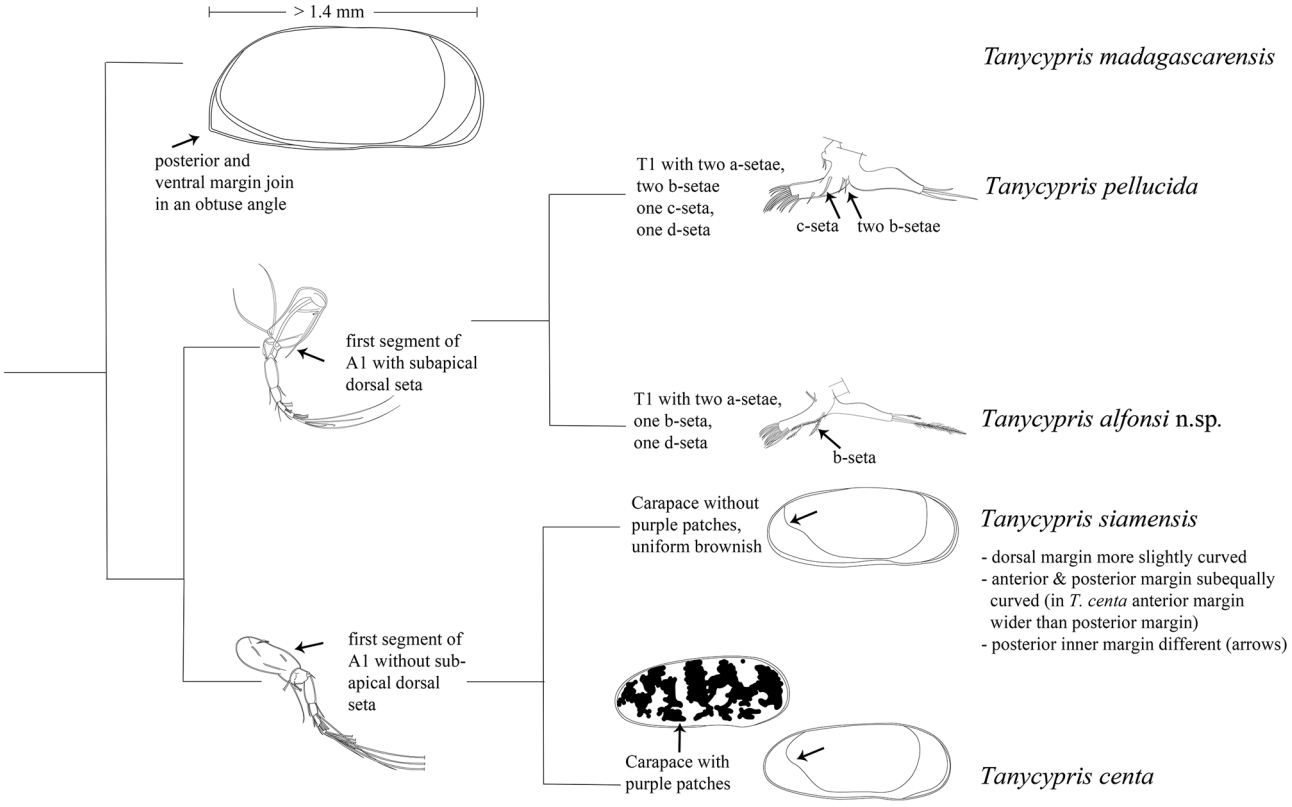

FIGURE 11. Graphical key for species of the genus *Tanycypris*.

Identification key to the species of *Tanycypris* (Fig. 11)

Based on the revision of the diagnostic characters and the revised number of species belonging to the genus, we propose an identification key for *Tanycypris*.

1. L > 1.4 mm; LV with an obtuse angle at the joining of posterior and ventral margin . . . . . *Tanycypris madagascarensis*
– L < 1.4 mm; LV without this obtuse angle 2
2. First segment on A1 with one long dorsal subapical seta 3
– first segment on A1 without a dorsal subapical seta 4
3. T1 with two b-setae and one c-seta . . . . . *Tanycypris pellucida*
– T1 with one b-seta and without c-seta . . . . . *Tanycypris alfonsi* n. sp.
4. Carapace with irregular purple patches, anterior end broader rounded than posterior end in lateral view, dorsal margin straight, posterior inner margin as in Fig. 11 . . . . . *Tancypris centa*
– Carapace uniform brownish-yellow, without purple patches, dorsal margin slightly curved, posterior inner margin as in Fig. 11 . . . . . *Tanycypris siamensis*

Status of other species in the subfamily investigated

Tribe Cypricercini McKenzie, 1971

Genus *Cypricercus* Sars, 1895

***Cypricercus inermis* (Brady, 1904)**

* 1904 *Cypris inermis* Brady: 125, pl. VIII. figs 44–49.
1910 *Eucypris inermis*—Daday: 167–169, pl. 9. figs 18–33.
1971 *Tanycypris inermis*—McKenzie: 172, 208.
2001 *Cypricercus cuneatus*—Martens: 62–64, 70.
2009b *Cypricercus inermis*—Savatenalinton & Martens: 2.

Diagnosis. L = 0.97–1.11 mm; H = 0.45–0.47; carapace in lateral view elongated. Length = 2.4 times height. Valves greyish-white. LV overlapping RV ventrally, LV longer than RV anteriorly, RV longer than LV posteriorly. Valve surface with shallow pits and thin setae. A1 with small Rome organ. T1 with a-, b- and d-seta.T2 with d1, which is twice as long as d2. CR stout with four groups of setulae on the ventral margin. CR attachment with Triebel loop in the middle, and a long, well developed vb (Brady 1904; Savatenalinton & Martens 2009b). Hemipenis with triangular lateral shield and rounded distal and medial shields. Zenker organ long with 22 chitinous rosettes (for more details see Savatenalinton & Martens 2009b).

History. Brady (1904) named this species *Cypris inermis* and provided its first description. Daday (1910) transferred the species to the genus *Eucypris*. McKenzie (1971) reported the existence of *Tanycypris inermis*, which he found in a "small clear pool, formed by drippings of a spring in the near of (sic) Rydal Mount, Witsieshoek, Orange Free State". Martens (2001) transferred it to *Cypricercus* under the assumption of synonymy with *Cypricercus cuneatus,* a view, that was not followed in Savatenalinton & Martens (2009b), where *Cypricercus inermis* and *Cypricercus cuneatus* were treated as two separate species, which "can be distinguished from it [*C. cuneatus*] by the appearance of the unequal posterior valve margins, by the features of the caudal ramus and attachment and by the morphology of the hemipenis and the Zenker's organ" (Savatenalinton & Martens 2009b).

Conclusion. This species differs from *Tanycypris* in the presence of a well-developed vb and of a long groove in LV in *C. inermis*. The width of the carapace is greater than one-third of the length in *C. inermis* and thus greater than in the genus *Tanycypris* (Martens 2001; Savatenalinton & Martens 2009b).

Tribe Nealecypridini Savatenalinton & Martens, 2009a

Genus *Diaphanocypris* Würdig & Pinto, 1990

***Diaphanocypris meridana* (Furtos, 1936)**

* 1936 *Herpetocypris meridana* Furtos: 101–102, figs 60–63.
v 1963 *Dolerocypris sagitta* (Klie)—Löffler: 200.
1984 *Tanycypris meridana*—Broodbakker: 16–21, figs 1–2.
v; non 1984 *Strandesia pedroensis*—Broodbakker: 16.
1984 *Herpetocypris bonettoi* Ferguson—Broodbakker: 16.
1990 *Diaphanocypris meridana*—Würdig & Pinto: 31–38, pls 1–3.
2011 *Herpetocypris muhitis* (Tressler)—Martens & Savatenalinton: 35.

Diagnosis. L = 1.22–1.31 mm, H = 0.51–0.56 mm, W = 0.35 mm; carapace in lateral view elongate-reniform, in dorsal view elliptical; four times longer than broad. Valve surface striate with a light green colour. LV slightly larger than RV. Anterior part of internal LV without groove and without inner list. A1 with small Wouters organ and Rome organ. T1 without b- and d-setae. T2 without d1 and without d2. CR approximately straight and strongly serrate. CR attachment with two loops; vb is reduced to a small spine, or absent, respectively. Males unknown (Furtos 1936; Broodbakker 1984; Würdig & Pinto 1990; Savatenalinton & Martens 2009).

History. Furtos (1936) named *Herpetocypris meridana* and was the first to describe it; she found it near Mérida (Mexico). The holotype is deposited in NMNH (No. 67974).

Löffler (1963) assumed *Doleroypris sagitta* Klie, 1939 and *Herpetocypris meridana* Furtos, 1936 were synonyms and rejected a generic assignment of this species to the genus *Herpetocypris.* However, Löffler did not examine type material. Broodbakker (1984) redescribed *H. meridana* as *Tanycypris meridana*, because of its typical CR and CR attachment, which has two eyelets and a reduced vb. He suggested *Strandesia pedroensis* Tressler, 1950 and *Herpetocypris bonettoi* Furtos, 1936 were synonyms of, or at least closely related to, *T. meridana.* His material from several Caribbean islands is deposited in the collection of the Zoological Museum Amsterdam, which has recently been incorporated into the collections of Naturalis Biodiversity Center, Leiden.

Ferguson (1967) described *Herpetocypris bonettoi,* which he found in Madreijon don Felipe (Santa Fe, USA; NMNH No. 112987 and No. 112987). *H. bonettoi* is distinguished from *H. meridana* by body size and the appearance of the CR.

Martens & Behen (1994) proposed a new combination, *Dolerocypris bonettoi,* which Broodbakker had transferred to *Tanycypris* back in 1984. Würdig & Pinto (1990) synonymized *Herpetocypris meridana* Furtos, 1936 with *Dolerocypris sagitta* Klie, 1939, *Herpetocypris bonettoi* Ferguson, 1967 and *Tanycypris meridana*. They erected the genus *Diaphanocypris* for this species, characterized by the lack of any structures in the inner lamella.

Martens & Savatenalinton (2011) and Karanovic (2012) synonymized *Diaphanocypris meridana* additionally with *Herpetocypris muhitis* Tressler, 1950.

According to Karanovic (2012) *Diaphanocypris meridana* is present in the collection of ZMH (No. 1509), but this slide is actually labelled *Dolerocypris sagitta* (Keyser & Schöning 1996).

Conclusion. After examination of syntype material of *Dolerocypris sagitta* and the holotype of *Strandesia pedroensis* we conclude: 1. *Diaphanocypris meridana* is a synonym of *Dolerocypris sagitta* and *Herpetocypris bonettoi* (however, the type material of the latter was not available due to relocation of the collection during the preparation of the present study. Subsequent inquiries have not been replied, so that the actual status of this material cannot be detailed). 2. *Strandesia pedroensis* is here transferred to *Diaphanocypris* (see *Diaphanocypris pedroensis* nov. comb.). The possible synonymisation with *Herpetocypris muhitis* was not studied here.

Diaphanocypris pedroensis nov. comb. (Tressler, 1950)

(Fig. 12A, D–F)

v * 1950 *Strandesia pedroensis*—Tressler: 79, Fig. 14 p–r, x.
2011 *Tanycypris pedroensis*—Martens & Savatenalinton: 75–76.

Diagnosis. L = 1.33 m, H = 0.56 mm, H < 2L; greatest height at posterior third. Carapace in dorsal view narrow, elongated. Anterior margin broadly rounded. Posterior margin sloping ventrally. Surface of carapace smooth and sparsely set with setae. A1 with Wouters organ and Rome organ (Fig. 12A). T1 without b-seta and without d-seta (Fig. 12D). T2 without d1 and without d2. CR short and arcuate, Sp located at the base of Gp and "separated from it by less than the width of the seta" (Tressler 1950) (Fig. 12E). CR-Attachment without vb, but with two loops and a very long and slender db (Fig. 12F). Males unknown (Tressler 1950).

History. Tressler (1950) described this species as *Strandesia pedroensis.* He deposited the holotype in the NMNH (No. 83008). Broodbakker (1984) suggested that this species could be a synonym of, or at least a near relative of, *Tanycypris inermis.* Savatenalinton & Martens (2009b) list *Strandesia pedroensis* under "uncertain species in *Strandesia*". Two years later Martens & Savatenalinton (2011) combined it as *Tanycypris pedroensis* without comment and listed the species as *Strandesia pedroensis* as well.

Conclusion. The lack of d1- and d2-seta on T2, the lack of b- and d-setae on T1 and the lack of vb on the CR attachment are characters typical of the genus *Diaphanocypris* in the Cypricercinae. Therefore we here suggest the new combination of *Diaphanocypris pedroensis.* This view is supported by the carapace shape in dorsal view, which is egg-shaped and not elliptical as in *Tanycypris* and *Strandesia*. *Diaphanocypris pedroensis* nov. comb. differs from *D. meridana* in the presence of a G2-seta on the A2 (no claw as in *D. meridana*), in the relatively shorter and arcuate CR (long and straight in *D. meridana*), the position of Sp in relation to the base of Gp (in *D. meridana* it is separated by more than the width of Sp) and the lateral outline of the carapace, which in *D. pedroensis* is more elevated and more oval than in *D. meridana*.

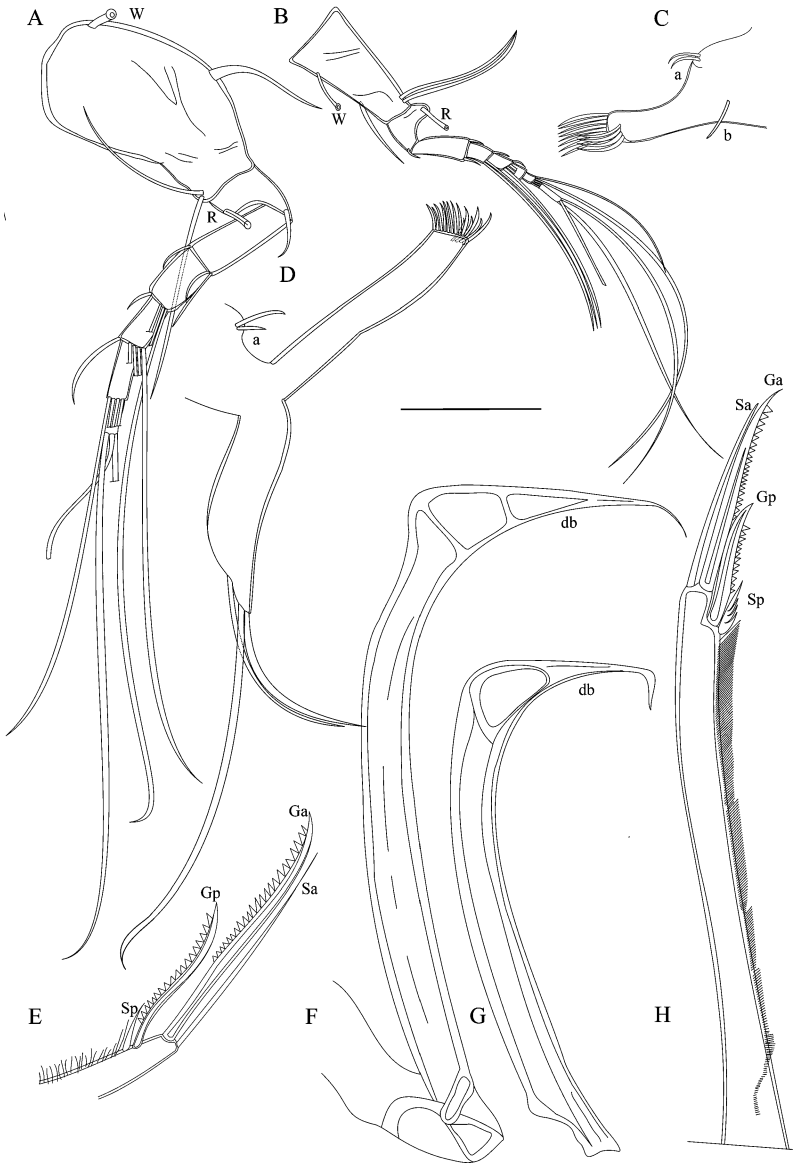

FIGURE 12. *Diaphanocypris pedroensis* and *Nealecypris clavigera*. A, A1 *D. pedroensis*; B, A1 *N. clavigera*; C, T1 (female) *N. clavigera*; D, T1 (female) *D. pedroensis*; E, CR *D. pedroensis*; F, CR attachment *D. pedroensis*; G, CR attachment *N. clavigera*; H, CR *N. clavigera*. Scale bar = 100 μm for A–H.

Genus *Nealecypris* Savatenalinton & Martens, 2009

Nealecypris clavigera nov. comb. (Müller, 1898)

(Fig. 12B,C,G,H)

v * 1898 *Cypris clavigera*—G.W. Müller: 269–271, pl. 16, figs 14–21.
1912 *Dolerocypris clavigera*—G.W. Müller: 191–192.
1965 *Tanycypris clavigera*—Rome: 17–21, fig. 3 A–S.
v; non 1969 *Dolerocypris pellucida*—Petkovski in Rome: 192.
1971 *Tanycypris clavigera*– McKenzie: 172, 208.

Diagnosis. L = 0.75–0.8 mm, H = 0.18–0.25 mm; ratio width to length = 2.9:10; greatest height at the anterior first fourth. Carapace in dorsal view narrow, strongly gaping posteriorly. Surface of the valves with fine, flat stripes.

Dorsal margin almost straight; ventral margin slightly sinous. Inner lamella very broad at the anterior end. A1 with Wouters organ and Rome organ (Fig. 12B). T1 with 2 a-setae and 1 seta in the distal median area, of which it cannot be stated whether it is a b-seta or d-seta (Fig. 12C). T2 with a very long d1 and an inconspicuous d2. CR very long and straight (Fig. 12H). CR attachment short and stout, without vb and with db, forming a right angle (Fig. 12G). Zenker organ with 15 rosettes of chitinous spines. All shields of the hemipenis bluntly rounded (Müller 1898; Rome 1965).

History. Müller (1898) described *Cypris clavigera,* which he found in Madagascar, and deposited the type material in ZMG. Later, he transferred it to *Dolerocypris* (Müller 1912). Rome (1965) assigned it to *Tanycypris*, because of the characteristic CR attachment. Petkovski, in the discussion following Rome's talk during the 2nd International Symposium on Ostracoda (discussion published in Rome 1969) argued that *Dolerocypris pellucida* is most likely a *Tanycypris* and probably even a synonym of *Tanycypris clavigera*. McKenzie (1971), while describing South African freshwater ostracods, followed Rome (1965) in assigning *D. clavigera* to *Tanycypris*. In contrast, Broodbakker (1984) cast doubt on Rome's description and called for a re-examination of *Dolerocypris clavigera*.

While the holotype could not be found in the ZMG collection, three slides with dissected paratypes (No. 32 e) were examined.

Conclusion. The generic state of *Dolerocypris clavigera* is still controversial; however, it is obvious that this species does not belong to the genus *Tanycypris*, because of its lack of vb on the CR attachment (present in *Tanycypris*), its lack of a groove in the inner lamella of LV (present in *Tanycypris*) and the lack of a second seta in the median distal area of T1 (in *Tanycypris* one b- and one d-seta are present). An assignment to *Astenocypris* can also be excluded due to the lack of vb and the well-developed db (*Astenocypris* has a short vb and a short, pointed db).

If the seta in the distal median area of T1 is interpreted as a d-seta, the species *clavigera* cannot be assigned to any genus of the subfamily. In contrast, if this seta is interpreted as a b-seta, the key characters of this species lead to an assignment to the genus *Nealecypris*. Therefore, we suggest the new combination *Nealecypris clavigera*.

Nealecypris clavigera nov. comb. differs from *N. obtusa* in the dorsal margin (straight in *N. clavigera*, slightly arched in *N. obtusa*), in the length (L < 1 mm in *N. clavigera*, L > 1 mm in *N. obtusa*), in the number of setae on the masticatory process of T1 (12 in *N. clavigera*, 14 in *N. obtusa*), in the shape of db (longer and slimmer in *N. obtusa*) and in the size of the Wouters and Rome organs (large in *N. clavigera,* inconspicuous in *N. obtusa*).

Nealecypris obtusa (Klie, 1933)

(Figs 5D, 6A,F, 7A)

v * 1933 *Dolerocypris obtusa* Klie: 98–99, Figs 5–7.
1971 *Tanycypris obtusa*—McKenzie: 172, 198.
v 2009a *Nealecypris obtusa*– Savatenalinton & Martens: 8–12, Figs 2A, 3A, 5A–H, 6A–F, 7A–D.

Diagnosis. L = 1.1–1.2 mm, H = 0.35–0.40 mm, W = 0.20–0.25 mm; greatest height at the anterior third of the length. Valves in lateral view elongated. Carapace in dorsal view narrow and acuminate at both ends. Dorsal margin weakly arched, sloping posteriorly. Anterior margin broader rounded than posterior margin. Ventral margin almost straight. Carapace surface smooth. Valves very thin. A1 (Fig. 5D) with a small Wouters organ and a very small Rome organ. T1 with two a-setae, one b-seta, without d-seta (Fig. 6F), males with asymmetric T1. T2 with large d1 and short, slim d2. CR stout (Fig. 6A). Sp inconspicuous and fringy with a pointed tip. CR attachment without vb and a slim, long db (Fig. 7A). Zenker organ with 24 rosettes of chitinous spines; hemipenis with subequal shields, small (Klie 1933; Savatenalinton & Martens 2009a).

History. Klie (1933) described *Dolerocypris obtusa,* which he found in the Lake Chrissie area in Transvaal and deposited the material in ZMK (No. CR—1071). McKenzie (1971) transferred the species to *Tanycypris*. Savatenalinton & Martens erected the new genus *Nealecypris* for this species (2009a).

Conclusion. After examination of the holotype and additional material from Thailand, we confirm the assignment of this species to the genus *Nealecypris*, characterized by the lack of b-seta on T1, the lack of vb on CR attachment and the lack of a groove in the anterior part of the inner lamella in LV. However, using the presence/absence of the Wouters organ as a character to distinguish between *Tanycypris* (Wouters organ absent) and

Nealecypris (Wouters organ present), as suggested by Savatenalinton & Martens (2009a), cannot be followed, since the Wouters organ is present in all *Tanycypris* species as well.

Subfamiliy Dolerocypridinae Triebel, 1961

Genus *Dolerocypris* Kaufmann, 1900

Dolerocypris marina (Hartmann, 1965)

* 1965 *Dolerocypris marina* Hartmann: 336–338, figs 52–55.
1969 *Tanycypris marina*—Petkovski in Rome: 192.
2011 *Tanycypris marina*—Savatenalinton & Martens: 5, 76.

Diagnosis. L = 1.02–1.03 mm, H = 0.34 mm. Carapace in lateral view elongated. Surface of the valves smooth. Dorsal margin almost straight. Ventral margin slightly curved. T3 without pincer organ, the subterminal segment undivided. CR long, stout with fine setules on the dorsal margin. Males unknown (Hartmann 1965).

History. Hartmann (1965) was uncertain about this species. He assigned it to *Dolerocypris*, because he could not find characteristics differing from the generic diagnosis of *Dolerocypris*. Petkovski, in the discussion following Rome's talk during the 2nd International Symposium on Ostracoda (discussion published in Rome 1969), advanced the position that *D. marina* belonged to *Tanycypris*. Martens & Savatenalinton (2011) followed this view without further comment.

Conclusion. The holotype (ZMH, No. 27603) seems to be lost. No specimens of the type series or any other specimens could be traced, so that currently the generic status of this species cannot be verified.

Subfamily Herpetocypridiniae Brady & Norman, 1889

Genus *Herpetocypris* Brady & Norman, 1889

Herpetocypris telavivensis (Krampner, 1928)

Nomen nudum 1928a *Herpetocypris telavivensis*—Krampner: 284, 286, 288.
* 1928b *Herpetocypris telavivensis* Krampner: 267–270, figs 1–11.
1992 *Tanycypris telavivensis*—Martens *et al.*: 114.

Diagnosis. L = 2.2–2.5 mm; H = 1 mm; W = 0.75 mm; Carapace in dorsal view egg-shaped, yellowish-brown, translucent; LV and RV differing in shape, with LV>RV. CR asymmetric, with left trunk thin and curved, and right trunk stout and straight. Males unknown (Krampner 1928b).

History. Krampner (1928a) mentioned this species for the first time in an ecological publication on a temporary freshwater pool near Tel Aviv without any taxonomic description, thus producing a nomen nudum. She acknowledged the help of Vincent Brehm (Lunz, Austria), to whom she had sent her material for identification. A short time later, she published the taxonomic description of *Herpetocypris telavivensis* (see Krampner 1928b). No further record of this species has been published ever since and Martens *et al.* (1992) transferred it to *Tanycypris* without explanation.

In the frame of this study, several attempts were made to track down Krampner's material. It is not present in the Vulkani-Institute (Tel Aviv), nor in the University collections of Tel Aviv and Jerusalem. Our focus was therefore on finding Vincent Brehm's collection, to whom Krampner had given her material for identification. According to a short online biography of Brehm (Adamicka 2010) the limnologist Vladimir Kořinek transferred some of Brehm's collection to the British Museum of National History, London, in 1988. However, this transfer was not confirmed by the NHM, nor were any of Brehm's ostracods found in their collection.

Until the 1950s, Brehm closely collaborated with Hans Wolfgang Schäfer, limnologist and ostracodologist in

Berlin. Schäfer immigrated to South Africa in 1954 and soon continued ostracod research as an employee of the then Department of Agricultural Technical Services. However, Schäfer ceased publishing on ostracods and information on his further career has long been unavailable.

An indication of the whereabouts of the Brehm collection emerged when investigating the archive of Erich Triebel's correspondence, housed in the Senckenberg Institute (Frankfurt, Germany). Triebel, founder and head of the micropaleontological section from 1939 to 1969, corresponded with researchers worldwide. The correspondence with Schäfer includes a letter sent from Pretoria in 1961, where Schäfer claims to have the largest private ostracod collection, particularly because Vincent Brehm had given him all ostracod material he owned. In the same letter, Schäfer explained that his collection and documents would go to the Transvaal Museum in Pretoria (now Ditsong National Museum of Natural History) after his death.

Attempts to find the Schäfer collection, and thus the Brehm material, in the Ditsong Museum have not (yet) been successful. For the time being, Brehm's material cannot be tracked down and thus the material Krampner gave to Brehm must be considered lost. An evaluation of the generic assignment must therefore be carried out based on the original description only.

Conclusions. Following Krampner's description and illustrations (1928b), three characters of *H. telavivensis* are clearly different from *Tanycypris*: in dorsal view, the carapace is egg-shaped (not elliptical, or torpedo-shaped as in *Tanycypris*), the valve outline in lateral view is too rectangular for the genus *Tanycypris,* and the asymmetry of the caudal rami is not typical of *Tanycypris*, either. In contrast, this asymmetry has been regarded as typical of the Near Eastern species of *Herpetocypris* by Krampner (1928b: 270).

A final assessment, however, can only be provided if Krampner's material reappears in the future. For the time being, we here reject an assignment of this species to the genus *Tanycypris*.

Final Conclusions

1. One new species, *T. alfonsi* n. sp., is described.
2. The genus *Tanycypris* now comprises five species*: Tanycypris alfonsi* n. sp., *Tanycypris centa, Tanycypris madagascarensis, Tanycypris pellucida, Tanycypris siamensis*. An identification key for the genus *Tanycypris* is presented, based on the following characters: Wouters organ on A1, subapical dorsal seta on the first segment of A1, configuration of b-, c- and d-setae on T1, the shape of the inner margin, the characters of the inner calcified lamella and the outline of the carapace.
3. Two new combinations are proposed: *Diaphanocypris pedroensis* and *Nealecypris clavigera*. Consequently, the genera *Diaphanocypris* and *Nealecypris* are no longer monospecific.
4. *Herpetocypris bonettoi* and *Dolerocypris sagitta* are junior synonyms of *Diaphanocypris meridana*.
5. *Strandesia camaguinensis* Triebel, 1950 is a junior synonym of *Tanycypris pellucida*.
6. Owing to the lack of type material, we were unable to clarify the generic status of *Herpetocypris telavivensis* and *Dolerocypris marina.*

Acknowledgements

We are grateful to Dr. Peter Michalik (ZMG), Dr. Rafael Lemaitre (NMNH), Dr. Dietmar Keyser and Prof. Angelika Brandt (ZMH) and to Prof. Alan Lord (SNG) for providing material and permission to use the collections. We also acknowledge the help of Dr. Robin Smith, Prof. Koen Martens, Dr. Savatenalinton Sukonthip and Dr. Trajan Petkovski who provided material and valuable information. Eva Schmidbauer and Andreas Richter of the Munich Botanical Garden permitted unlimited access to the greenhouse.

We thank the working group of Prof. Christian Laforsch and particularly Jessica Fischer (now University of Bayreuth) for giving us access to their confocal-fluorescent microscope and for sharing their know-how. We are grateful to Prof. Christoph Mayr (University Erlangen), Cora Ovens (daughter of H.W. Schäfer, RSA), Dr. Heidi Fourie (Ditsong National Museum of Natural History, Pretoria, RSA), Dr. Dirk Platvoet (Naturalis Biodiversity Center Leiden, The Netherlands), Miranda Lowe (The Natural History Museum London, UK), and Dr. Avi Honigstein (Jerusalem, Israel) for their support during various phases of our study.

References

Adamicka, P. (2010) Biography of Vincenz Brehm (in German). Available from: http://de.wikipedia.org/wiki/Vincenz_Brehm (Accessed 17 Jan. 2014)

Brady, G.W. (1904) On Entomostraca collected in Natal by J. Gibson. *Proceedings of the Zoological Society of London*, 1904 121–128.
http://dx.doi.org/10.1111/j.1469-7998.1904.tb08317.x

Brady, G.W. (1913) On freshwater entomostraca from various parts of South Africa. *Annals of the Natal Museum*, 2, 459–474.

Bronshtein, Z.S. (1947) Fresh-water Ostracoda. Fauna of the USSR Crustaceans, Vol. II, Academy of Sciences of the USSR Publishers, Moscow. [translated from Russian for the United States Department of the Interior and the National Science Foundation, Washington D. C., *Amerind Publishing*, New Delhi, 1988, pp. 470.]

Broodbakker, N.W. & Danielopol, D.L. (1982) The Chaetotaxy of Cypridacea (Crustacea, Ostracoda) limbs: Proposal for a descriptive model. *Bijdragen tot de Dierkunde*, 52, 103–120.

Broodbakker, N.W. (1984) The genus *Tanycypris* (Crustacea, Ostracoda) in the West Indies. *Bijdragen tot de Dierkunde*, 54, 15–24.

Chang, C.Y., Lee, J. & Smith, R.J. (2012) Nonmarine ostracods (crustacea) from South Korea, including a description of a new species of *Tanycypris* Triebel (Cyprididae, Cypricercinae). *Zootaxa*, 3161, 1–19.

Coleman, C.O. (2003) „Digital inking": How to make perfect line drawings on Computers. *Organisms Diversity & Evolution,* 3, 1–14.
http://dx.doi.org/10.1078/1439-6092-00081

Daday, E. (1910) Die Süßwasser-Mikrofauna Deutsch-Ost-Afrikas Lieferung 3. *Zoologica Original-Abhandlungen aus dem Gesamtgebiete der Zoologie,* 23, 113–176.

Ferguson, E. Jr. (1967) Three new species of freshwater ostracods (Crustacea) from Argentina. *Notulae Naturae of the Academy of Sciences of Philadelphia,* 405, 1–7.

Furtos, N.C. (1936) On the Ostracoda from the Cenotes of Yucatan and Vicinity. *In:* Pearse, A.S., Creaser, E.P., Hall, F.G. & Hubbs, C.L. (Eds.), Carnegie Institution of Washington Publications, *The Cenotes of Yucatan*, 457, 89–115.

Fox, H.M. (1965) Ostracod Crustacea from ricefields in Italy.*Memorie dell' Istituto Italiano di Idrobiologia*, 18, 205–214.

Hartmann, G. (1965) Ostracoden des Sublitorals. *In*: Hartmann-Schröder, G. & Hartmann, G. (Eds.), *Zur Kenntnis des Sublitorals der chilenischen Küste unter besonderer Berücksichtigung der Polychaeten und Ostracoden*. *Mitteilungen des Zoologischen Museums, Hamburg,* 62, 336–338.

Higuti, J., Velho, L.F.M., Lansac-Töha, F.A. & Martens, K. (2007) Pleuston communities are buffered from regional flood pulses: the example of ostracods in the Paraná River floodplain, Brazil. *Freshwater Biology*, 52, 1930–1943.
http://dx.doi.org/10.1111/j.1365-2427.2007.01821.x

Karanovic, I. (2012) Recent Freshwaster Orstracods of the world. *Springer-Verlag*, Heidelberg, Berlin, pp. 608.

Kempf, E.K. (1980–2006) Index and bibliography of nonmarine Ostracoda 1–10, 16. Sonderveröffentlichungen des Geologischen Instituts der Universität zu Köln, or CD-ROM. Available from: http://ostracoda-on.tripod.com (Accessed 17 Jan. 2014)

Keyser, D. & Schöning, C. (1996) Katalog des Ostracoden-Typenmaterials in Deutschland. *Mitteilungen aus dem hamburgischen zoologischen Museum und Institut*, 93, 7–151.

Klie, W. (1932) Die Ostracoden der deutschen Limnologischen Sunda-Expedition. *Archiv für Hydrobiologie*, 11, 447–502.

Klie, W. (1933) Drei neue Süßwasser-Ostracoden aus Südafrika. *Zoologischer Anzeiger* 102, 65–74.

Klie, W. (1939) Süßwasserostrakoden aus Nordostbrasilien. *Zoologischer Anzeiger,* 128, 316–320.

Krampner, A. (1928a) Eine neue Art der *Herpetocypris-syriaca*-Gruppe. *Internationale Revue der gesamten Hydrobiologie und Hydrographie*, 21, 268–270.
http://dx.doi.org/10.1002/iroh.19280210207

Krampner, A. (1928b) Wandlungen der Kruster – und Rotatorien-Fauna eines perennierenden und eines temporalen Tümpels bei Tel Aviv (Palästina) im Verlaufe eines Jahres. *Internationale Revue der gesamten Hydrobiologie und Hydrographie*, 21, 281–288.
http://dx.doi.org/10.1002/iroh.19280190306

Löffler, H. (1963) Zur Ostrakoden- und Copepodenfauna Ekuadors (mit Beschreibung 6 neuer Arten und 3 neuer Unterarten). *Archiv für Hydrobiologie*, 59, 196–234.

Martens, K. (1987) Homology and functional morphology of the sexual dimorphism in the antenna of *Sclerocypris* Sars, 1924 (Crustacea, Ostracoda, Megalocypridinae).
Bijdragen tot de Dierkunden, 57, 183–190.

Martens, K. (1994) Towards a revision of the Cypricercinae (Crustacea, Ostracoda): on the validity of the genera *Neocypris* Sars, 1901 and Bradleycypris McKenzie, 1982. *Bulletin De L'Institut Royal Des Sciences Naturelles De Belgique,* 64, 231–233.

Martens, K. (2001) Ostracoda. *In*: Day, J., de Moor, I., Stewart, B. & Louw, A. (Eds.), *Freshwater Invertebrates of Southern Africa. Vol. 3. Crustacea II Ostracoda, Copepoda & Branchiura*. Water Research Commission, Pretoria, South Africa, 9–77.

Martens, K., Ortal, R. & Meisch, C. (1992) The ostracod fauna of Mamilla Pool (Jerusalem, Israel) (Crustacea, Ostracoda). *Zoology in the Middle East*, 7, 95–114.
http://dx.doi.org/10.1080/09397140.1992.10637628

Martens, K. &Behen, F. (1994) *A checklist of the recent non-marine ostracods (Crustacea, Ostracoda) from the inland waters of South America and adjacent island.*Travaux scientifiques du Musée national d'histoire naturelle de Luxembourg, 22, 1–81.

Martens, K. & Savatenalinton, S. (2011) A subjective checklist of the Recent, free-living, non-marine Ostracoda (Crustacea). *Zootaxa*, 2855, 1–79.

Matthews, S.C. (1973) Notes on open nomenclature and synonymy lists. *Palaeontology*, 16, 713–719.

Matzke-Karasz, R., Nagler, C. & Hofmann, S. (in press) The ostracod springtail – camera recordings of a previously undescribed high-speed escape jump in the genus *Tanycypris* (Ostracoda, Cypridoidea). *Crustaceana.*

McKenzie, K.G. (1971) Species List of South African freshwater Ostracoda with an appendix listing museum collections and some further determinations. *Annals of the South African Museum,* 57, 157–213.

McKenzie, K.G. & Moroni, A. (1986) Man as an agent of Crustacean passive dispersal via useful plants - exemplified by Ostracoda *ospiti esteri* of the Italian ricefields ecosystem and implications arising therefrom. *Journal of Crustacean Biology*, 6, 181–198.
http://dx.doi.org/10.1163/193724086x00019

Meisch, C. (2000) Freshwater Ostracoda of Western and Central Europe. *In*: Schwoerbel, J. & Zwick, P. (Eds.), *Süßwasserfauna von Mitteleuropa 8/3*. Spektrum Akademischer Verlag, Heidelberg, Berlin, pp. 522.

Moroni, A. (1967) *Ostracodi delle risaie italiane: sistematica, ecologia, distribuzione geografica*. Studium Parmense, Parma, 79 pp.

Müller, G.W. (1898) Ergebnisse einer zoologischen Forschungsreise in Madagaskar und Ost-Afrika 1889–1895 von Dr. A. Voeltzkow: Die Ostracoden. *Abhandlungen der Senckenbergischen naturforschenden Gesellschaft*, 21, 255–294.

Müller, G.W. (1912) Ostracoda. *In*: Schule, F.E. (Eds.), *Das Tierreich.* Königlich preußische Akademie der Wissenschaften zu Berlin, Verlag von R. Friedländer und Sohn, Berlin, pp. 1–437.

Okubo, I. (1972) *Strandesia camaguinensis* Tressler, 1937, from Japan (Ostracoda, Cyprididae). *Proceeding of the Japanese Society of Systematic Zoology*, 8, 8–14.

Okubo, I. (2004) *Nihon tansui san kaimijinko rui ni tsuite*. Kabushikigaisha Sanmon Insatsusho, Okayama, Japan, 72 pp. [in Japanese.]

Petkovski, T.K. (1964) Bemerkenswerte Entomostraken aus Jugoslawien. *ActaMusei Macedonici Scientiarum Naturalium,* 7, 144–182.

Ramirez, F.C. (1967) Ostracods de lagunas de la provincia de Buenos Aires.*Extracto de la Revista del Museo de La Plata, Nova Serie, Sección Zoología*, 10, 5–54.

Richter, R. (1948) *Einführung in die Zoologische Nomenklatur. 2nd Edition*. Kramer, Frankfurt a.M., pp. 252.

Rome, D.R. (1965) South African Animal Life, Results of the Lund University Expedition in 1950-1951. Crustacea Ostracoda. *Statens Naturvetenskapliga Forskningsråd,* 11, 9–58.

Rome, D.R. (1969) Morphologie de l'attache de la furca chez les Cyprididae et son utilisation en systématique. *In:* Neale, J. W. (Eds.), *The taxonomy, morphology and ecology of recent Ostracoda.* Oliver & Boyd, Edinburgh, 168–193.

Rossi, V., Benassi, G., Veneri, M., Bellarvere, C., Menozzi, P., Moroni, A. & McKenzie, K. (2003) Ostracoda of the Italian ricefields thirty years on: new synthesis and hypothesis. *Journal of Limnology*, 62, 1–8.
http://dx.doi.org/10.4081/jlimnol.2003.1

Savatenalinton, S. (2011) Ostracods (Crustacea) from the floodplain of the Chi River basin, Mahasarakham Province, Thailand, with first record of the male *Tanycypris siamensis* Savatenalinton & Martens, 2009. *In:* Gross, M. & Danielopol, D. (Eds.), Abstracts of scientific contributions to the 7th European Ostracodologists' Meeting Graz 2011. *Joannea Geologie und Paläontologie*, 11, 174.

Savatenalinton, S. & Martens, K. (2009a) Generic revision of Cypricercinae McKenzie, 1971 (Crustacea, Ostracoda) with the description of three new genera and one new species and a phylogenetic analysis of the subfamily. *Hydrobiologia*, 632, 1–48.
http://dx.doi.org/10.1007/s10750-009-9826-5

Savatenalinton, S. & Martens, K. (2009b) Redescription of the type species of *Strandesia* Stuhlmann, 1888 and *Cypricercus* Sars, 1895 (Crustacea, Ostracoda, Cypricercinae), with a description of a new species of *Cypricercus* from South Africa. *Zootaxa*, 2007, 1–42.

Tressler, W.L. (1937) Ostracoda. (Mitteilung 18 von der Wallacea-Expedition Woltereck 1932-32) *Internationale Revue der gesamten Hydrobiologie und Hydrographie,* 34, 188–207.
http://dx.doi.org/10.1002/iroh.19370340112

Tressler, W.L. (1950) Fresh-water Ostracoda from Brazil. *Proceedings of the United States National Museum*, 100 (1949), 61–83.
http://dx.doi.org/10.5479/si.00963801.100-3258.61

Triebel, E. (1959) Zur Kenntnis der Ostracoden-Gattungen *Isocypris* und *Dolerocypris*. *Senckenbergiana biologica*, 40, 155–170.

Victor, R. & Fernando, C.H. (1981) Freshwater ostracods (Crustacea: Ostracoda) of the subfamily Dolerocypridinae Triebel, 1961 from Southeast Asia. *Zoological Journal of the Linnean Society,* 72, 107–116.
http://dx.doi.org/10.1111/j.1096-3642.1981.tb01654.x

Würdig, N.L. & Pinto, I.D. (1990) *Diaphanocypris* a New Ostracoda Genus occurring in South and Central America. *Pesquisas,* 17, 31–39.