

## **A new *Garcorops* species from Madagascar copal (Araneae: Selenopidae)**

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### **Abstract**

*Garcorops jadis* sp. nov. is described from one male specimen enclosed in copal, a hardened, subfossil diterpenoid resin from the Sambava area, Madagascar. The taxonomy of the family Selenopidae and the relationships of the new species are briefly discussed.

**Key words:** Arachnida, Araneae, Selenopidae, *Garcorops*, new species, Madagascar, copal, subfossil

### **Introduction**

Spiders enclosed in Tertiary Baltic and Dominican amber are well known (Petrunkevitch 1942, 1958; Bachofen-Echt 1949; Wunderlich 1986, 1988; Poinar 1992). However, interesting spider inclusions have also been found in the more recent copal (Wunderlich 1986, 1988). Copal is a hardened, polymerised, subfossil diterpenoid resin (Lambert & Poinar 2002; Scalarone *et al.* 2003) which, contrary to amber, has not yet lost most of its volatile terpenes (Poinar 1992; Scalarone *et al.* 2003). While amber is of Tertiary age or older (Wunderlich 1986, 1988; Poinar 1992; Ross 1998), copal is estimated by different authors to be between a few hundred and four million years old, i.e. of Holocene, Pleistocene or Pliocene age (Schlee 1984; Wunderlich 1986; Poinar 1992; Anderson 1997; Dubois 1998). A large part of the copal in the world is produced by broad leaved trees of the family Fabaceae (Mägdefrau 1968). On the North-East coast of Madagascar, substantial amounts of copal with inclusions are found, originating from resin of *Hymenaea verrucosa* Gaertner (Poinar 1992; Poinar & Brown 2002). Inclusions in copal are mostly recent species, but extinct species have been found (Hills 1957). The author could obtain a piece of copal from the Sambava area, North-East Madagascar, containing a large male spider belonging to the family Selenopidae.

Selenopidae consists of ecribellate, entelegyne, laterigrade spiders with a flattened body, eight eyes in two rows and tarsi with two claws and claw tufts (Dippenaar-Schoeman & Jocqué 1997). Simon (1897) established the family as monotypic, comprising only the genus *Selenops* Latreille. Benoit (1968) split up *Selenops*, describing the new genera *Anyphops* Benoit, *Hovops* Benoit and *Orops* Benoit. *Orops* was later synonymised with *Selenops* by Corronca (1996). According to Platnick (2003), 174 recent species of Selenopidae are known to date, distributed over the genera as follows: *Anyphops* (62), *Hovops* (6), and *Selenops* (106). The fossil *Selenops beynai* Schawaller 1984 has been described from Dominican amber. Wunderlich (1988) mentioned three *Selenops* species from Dominican amber, based on juvenile specimens. Those were considered by Penney (2001) to be one *Selenops* sp. indet. From Madagascar, Platnick (2003) mentions six recent species of the endemic genus *Hovops*, as well as *Anyphops benoiti* Corronca 1998. However, Corronca (2003) recently described the new selenopid genus *Garcorops* Corronca 2003, encompassing three species of which two live in Madagascar. Moreover, Corronca (personal communication) is describing two new *Selenops* species from Madagascar. The present specimen from copal belongs to *Garcorops* and is described below as a new species.

#### Methods and abbreviations

All measurements are in millimeter. The specimen was observed, photographed and drawn under a binocular microscope equipped with an eyepiece grid and a Fuji Finepix 2800 digital camera. Where necessary, the copal piece was trimmed with fine grinding paper and polished with polishing paste. Eye nomenclature follows Corronca (2002), male palpal nomenclature follows Corronca (2003), the format for leg spination follows Platnick & Shadab (1975).

Abbreviations used: ALE, anterior lateral eyes; AME, anterior median eyes; C, conductor; do, dorsal; E, embolus; fe, femur; l, length; MA, median apophysis; MRAC, Royal Museum for Central Africa, Tervuren; mt, metatarsus; pa, patella; pl, prolateral; PLE, posterior lateral eyes; PME, posterior median eyes; rl, retrolateral; RTA, retrolateral tibial apophysis; ta, tarsus; ti, tibia; ve, ventral; w, width.

#### *Garcorops jadis* sp. nov. (Figs. 1–7)

**Type material.** Holotype male, MADAGASCAR: Sambava area, enclosed together with several small dipterous insects, a cockroach, a mite and a juvenile araneid spider in a copal piece measuring 70 x 20 x 12 mm (Fig. 1), purchased from dealer (MRAC).

**Diagnosis.** The new species is similar to *Garcorops madagascar* Corronca 2003 through the possession of a well developed cymbial dorsal scopula, a long embolus cir-

clinging the bulb, a T-shaped conductor with a blunt lateral projection, a small, unbranched, subtriangular, retrolaterally pointing MA with an almost straight tip, and a trifold RTA with a long, pointed dorsal branch (Figs. 3–5, 7). However, it differs from *Garcorops madagascar* in the dorsal RTA branch being directed ventrally instead of apically and in the longer, more apically implanted lateral projection of the conductor.

**Etymology.** The species is named after Jadis, the Ice Queen from C.D. Lewis' youth novel "The Lion, the Witch and the Wardrobe" because the beautiful holotype specimen seems like enclosed in ice, frozen in time forever.

**Description.**

**Male.** Total length 6.5. Carapace l: 3.0; w: 2.8. Carapace yellow-brown, with remnants of darker markings, covered by white hairs (Fig. 2). Clypeus straight, comparable in height to diameter of AME. First eye row composed of six eyes (Fig. 6): AME in the middle (diameter 0.22) flanked by large PME (diameter 0.27), and laterally from these small ALE, with diameter 0.11. PLE in a second row, with diameter 0.30. Chelicerae yellow-brown, small and pointed, bulging forward, with a pronounced cheliceral boss. Endites yellow-brown, subrectangular with blunt narrowed tip and tuft of terminal setae. Labium brown, short, with semicircular frontal rim. Sternum yellow-brown, shield-shaped, l: 2.0; w: 1.6.

Abdomen yellow-brown with darker brown markings (Fig. 2), covered with thin, pointed pale hairs.

Legs yellow-brown with clear remnants of darker annulations (Fig. 2), mt and ta III and IV missing. Leg spination: fe: I do 3-3-3; II do 1-1-2; III do 1-2-3; IV do 3-3-3; ti: I pl 1-0-1 rl 1-0-1 ve 2-2-2-2; II ve 2-2-2-2; III ve 2-(1)-2-1; IV pl 1-0-0 rl 1-0-1 ve 2-2-1; mt: I ve 2-2-2; II ve 2-2-2; III ve 2-?-?; IV ve 0-?-?.

Leg measurements:

	fe	pa	ti	mt	ta	total
I	5.3	1.3	4.3	4.0	2.0	16.8
II	5.5	1.3	4.5	4.5	2.2	17.9
III	5.0	1.3	4.5	-	-	-
IV	4.8	1.0	4.0	-	-	-

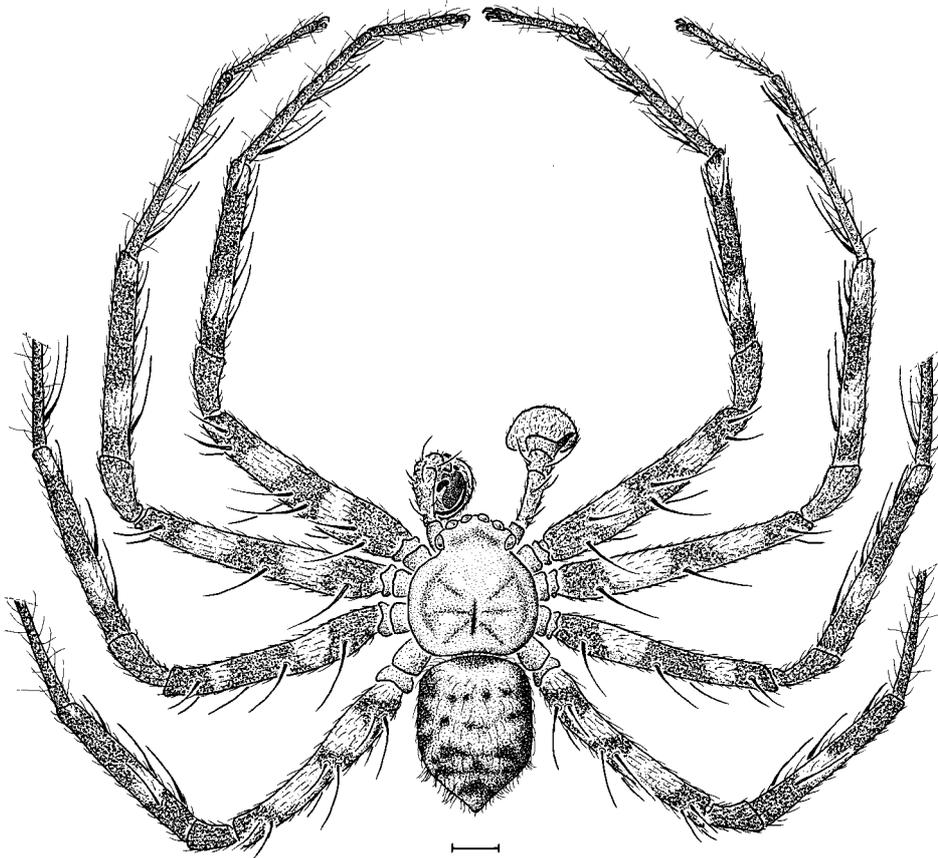
Male palp as illustrated (Figs. 3–5, 7), ti with trifold RTA with short, pointed posterior branch, long, flattened and pointed anterior branch and blunt third branch (Figs. 3, 7). Embolus long, completely encircling bulb. Conductor T-shaped, bearing a blunt lateral projection, rl tip long and pointed, directed backwards (Figs. 3–5). MA basally implanted on bulb, subtriangular, pointing retrolaterally outwards (Figs. 3–5). Left palp could be observed laterally (Figs. 3, 7), right palp could only be seen from the frontal-ventral side (Fig. 4). Ventral view of left palp (Fig. 5) has been reconstructed from both observations.

Female. Unknown.

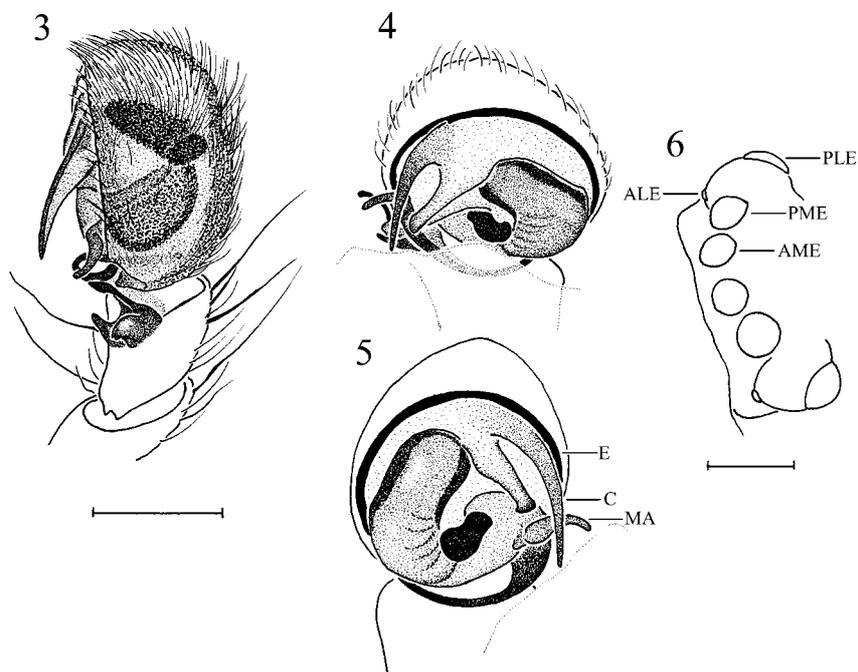
**Distribution.** Only known from a beached piece of copal of uncertain origins and age, found in the vicinity of Sambava, Madagascar.



**FIGURE 1.** *Garcorops jadis* sp. nov., male holotype in Madagascar copal.



**FIGURE 2.** *Garcorops jadis* sp. nov., male holotype, reconstruction. Scale bar: 1 mm.



**FIGURES 3–6.** *Garcorops jadis* sp. nov., male holotype. 3, left male palp, rl view; 4, right male palp, frontal-ventral view; 5, left male palp, ve view, reconstruction; 6, eye region, frontal-lateral view. Scale bars: 0.50 mm. Abbreviations: ALE, anterior lateral eyes; AME, anterior median eyes; C, conductor; E, embolus; MA, median apophysis; PLE, posterior lateral eyes; PME, posterior median eyes.



**FIGURE 7.** *Garcorops jadis* sp. nov., male holotype. 7, left male palp, rl view.

## Discussion

*Garcorops jadis* clearly belongs in the genus *Garcorops* through the almost straight anterior row of six eyes with AME-ALE in a slightly recurved row, PME > AME with AME closer to clypeal edge, PME-ALE aligned and PME-PLE in a strongly recurved row (Fig. 6). Other characters which attribute the new species to *Garcorops* are the structure of the male palp (see diagnosis), the large cheliceral boss and the presence of four ventral spine pairs on ti I and II as well as three ventral spine pairs on mt I and II. Since the holotype specimen is enclosed in copal, *Garcorop jadis* may be an extant species not yet discovered in its natural habitat (Hills 1957). Tree resin can indeed function in a way similar to a trunk eclector trap (Dubois & LaPolla 1999), a capture method which is reputed for producing specimens of species seldom captured otherwise (Simon 1995). However, *Garcorops jadis* may also be already extinct.

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