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Four new species of Gracillariidae (Lepidoptera) from China and Japan, and description of the pupal morphology of the genera *Corythoestis*, *Eumetriochroa*, *Guttigera*, and *Metriochroa*

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Abstract

Four new leaf mining Oecophyllembiinae (Gracillariidae) species are described from China and Japan: *Metriochroa symlocosella* sp. nov. (host plants: *Symplocos anomala*, *S. sumuntia*, Symplocaceae) from China, *Guttigera schefflerella* sp. nov. (host plant: *Schefflera octophylla*, Araliaceae), *Eumetriochroa araliella* sp. nov. (host plants: *Dendropanax trifidus*, *Evodiopanax innovans*, *Eleutherococcus sciadophylloides* and *Fatsia japonica*, Araliaceae) and *Corythoestis tricalysiel-la* sp. nov. (host plant: *Tricalysia dubia*, Rubiaceae) from Japan. *Corythoestis sunosei* (Kumata, 1998) is recorded from new host plants: *Adina pilulifera* and *Mussaenda parviflora*, Rubiaceae, from Japan. The female adult and pupal morphologies, life history and host plant of the genus *Guttigera* are described for the first time. Pupae of seven species of four genera: *Corythoestis*, *Eumetriochroa*, *Guttigera*, and *Metriochroa*, are described for the first time. We provide morphological diagnostic differences between species and genera of Oecophyllembiinae and *Phyllocnistis*. Our preliminary data suggest that Oecophyllembiinae species have three valuable pupal diagnostic characters: 1) cocoon cutter with unique lateral processes or setae on the clypeus, 2) tergal spines with only a pair of dorsal setae, and 3) cremaster with more than two pairs of caudal processes, while *Phyllocnistis* species possess 1) cocoon cutter without lateral processes or setae on clypeus, 2) tergal spines with a pair of dorsal setae and dorsal hooks, and 3) cremaster with only a pair of caudal processes.

Key words: Araliaceae, *Corythoestis sunosei*, Leafminer, Oecophyllembiinae, *Phyllocnistis*, Rubiaceae, Symplocaceae

Introduction

Adult Oecophyllembiinae are some of the smallest of the leaf-mining gracillariid subfamilies, with a wing expanse of only 5–10 mm. Vári *et al.* (2002) treated Oecophyllembiinae as a synonym of Phyllocnistinae. De Prins & De Prins (2005, 2012) discussed the various opinions about the subfamily classification of the Gracillariidae and the placement of the seven genera that they recognized in the Phyllocnistinae: *Angelabella* Vargas & Parra, 2005, *Corythoestis* Meyrick, 1921, *Eumetriochroa* Kumata, 1998, *Guttigera* Diakonoff, 1955, *Metriochroa* Busck, 1900, *Phyllocnistis* Zeller, 1848, and *Prophyllonistis* Davis, 1994.

Recently, Kawahara *et al.* (2011) sequenced 21 genes (14,793 bp) for 57 taxa of Gracillarioidea and outgroups. In their analyses, the grouping of Oecophyllembiinae (*sensu* Kumata) + Phyllocnistinae, was supported weakly or not at all, but a sister-group relationship could not be rejected. Because the phylogenetic position of the sister-group remains unclear, we followed Kumata (1998) in recognizing six genera in the Oecophyllembiinae, with *Phyllocnistis* as the sole member of the Phyllocnistinae.

In China, five *Phyllocnistis* species have been recorded: *P. citrella* Stainton, 1856; *P. saligna* (Zeller, 1839); *P. wampella* Liu & Zeng, 1985; *P. breynilla* Liu & Zeng, 1989; and *P. embeliella* Liu & Zeng, 1989 (Liu & Zeng 1985, 1989). Kobayashi *et al.* (2011a) recorded two Oecophyllembiinae species: *Corythoestis sunosei* (Kumata, 1998) and