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RESEARCH

Combivena gen.n (Hymenoptera: Ichneumonidae: Acaenitinae) from China

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ABSTRACT. *Combivena* Sheng & Sun, gen.n. and *Combivena sulcata* Sheng & Sun, sp.n. belonging to Acaenitinae of family Ichneumonidae (Hymenoptera), collected from Qinghai Province, China, are described and illustrated.

Key Words: *Combivena*, new genus, new species, taxonomy, China

Subfamily Acaenitinae belonging to the family Ichneumonidae (Hymenoptera) has been traditionally classified into two tribes, the Acaenitini and Coleocentrini (Townes 1971; He et al. 1996; Yu et al. 2005; Lee and Lee 2009; Sheng and Sun 2009, 2010a, b; 2013; Yu et al. 2012). Wahl and Gauld (1998) suggested that "use of the two tribes be discontinued." Castillo et al. (2011) followed the opinion of Wahl and Gauld.

Acaenitinae comprises 27 genera (Yu et al. 2012). Seventeen genera have been reported in China (Sheng 2002; Sheng and Sun 2009, 2010b; Yu et al. 2012), of which two genera, *Cumatocinetus* Sheng 2002, *Dentifemura* Sheng and Sun (2010b), were reported by the authors. The subfamily was reported for the first time from South America by Castillo et al. (2011).

The prominent feature of Acaenitinae is the female: very large subgenital plate, triangular in lateral view, and the apex surpassing metasomal apex. The status of the genera was elucidated by Sheng and Sun (2010a) and Townes (1971).

The hosts of Acaenitinae mainly are woodborers (Sheng and Sun 2009, 2010a, b; Yu et al. 2012). Shaw and Wahl (1989) reported that *Acaenitus dubitator* (Panzer) is a koinobiont endoparasitoid of the larva of an endophytic beetle, *Cleonis piger* (Scopoli) (Curculionidae). *Jezarotes levis* Sheng 1999 parasitizing *Carcilia* sp. (Curculionidae) was discovered while the trunks of *Quercus wutaishanica* Blume were dissected in Xinbin County, Liaoning Province, China.

In this article, one new genus and its type species, collected in Huzhu County, Qinghai Province, China, are described.

Materials and Methods

The only known specimen of the new species was collected with intercept trap (Li et al. 2012) in the forest of Beishan Forestry Farm, Huzhu County, Qinghai Province, China. The forest composed of mixed deciduous angiosperms and evergreen conifers, mainly comprising *Betula platyphylla* Sukatschev, *Picea wilsonii* Masters, *Pinus tabulaeformis* Carriére, *Sabina przewalskii* (Komarov) W. C. Cheng & L.K. Fu, *Salix* sp., *Ribes* sp., *Sorbus* sp., *Cotoneaster* sp., and *Philadelphus* sp.

Images of whole bodies were taken using a CANON Power Shot A650 IS (www.web.canon.jp). Other images were taken using a Cool SNAP 3CCD (www.photomet.com) attached to a Zeiss Discovery V8 Stereomicroscope (www.zeiss.de) and captured with QCapture Pro version 5.1 (www.QIMAGING.COM). Morphological terminology is mostly based on Gauld (1991). Wing vein nomenclature follows Mason (1986, 1990).

Type specimens are deposited in the Insect Museum, General Station of Forest Pest Management, State Forestry Administration, Shenyang, People's Republic of China.

Nomenclature. This article and the nomenclature it contains have been registered in ZooBank (www.zoobank.org). This LSID number is urn:lsid:zoobank.org:pub:7E0DB228-FFB7-4105-A80F-E602695A9BDC.

Description.

Combivena Sheng & Sun, gen.n.

Diagnosis. Fore wing length ~10 mm. Clypeus without subapical transverse ridge, apical half flat, apical margin thin, and even arched forward. Labrum crescentic. Mandible small, strongly narrowed toward apex, and lower tooth evidently longer than upper tooth. Cheek with subocular sulcus. Malar space longer than basal width of mandible. Gena distinctly swollen. Frons with median longitudinal carina. Occipital carina complete, medially evenly arched upward. Anterior portion of mesoscutum almost vertical and median lobe with median longitudinal groove. Notaulus very strong, reaching beyond center of mesoscutum. Lower-posterior portion of mesopleuron convex, ridge shaped. Mesosternum (Fig. 6) with wide median longitudinal groove. Areolet absent. Vein 2rs-m disappeared. Rs combined with M far distal of 2m-cu. 2m-cu with one bulla. Apical edge of fore tibia with a distinct tooth at outer side. All tarsal claws with a median tooth on mesal side. Propodeum completely areolated, separated dorsal, and posterior surfaces by posterior transverse carina. First tergum (Fig. 10) evenly narrow toward base. First sternite reaching 0.4 distance from base to spiracle, subbase evenly convex, and without hair. Ovipositor compressed, without nodus, apical portion of ventral valve with weak longitudinal ridges.

Type species. *Combivena sulcata* Sheng & Sun, sp.n.

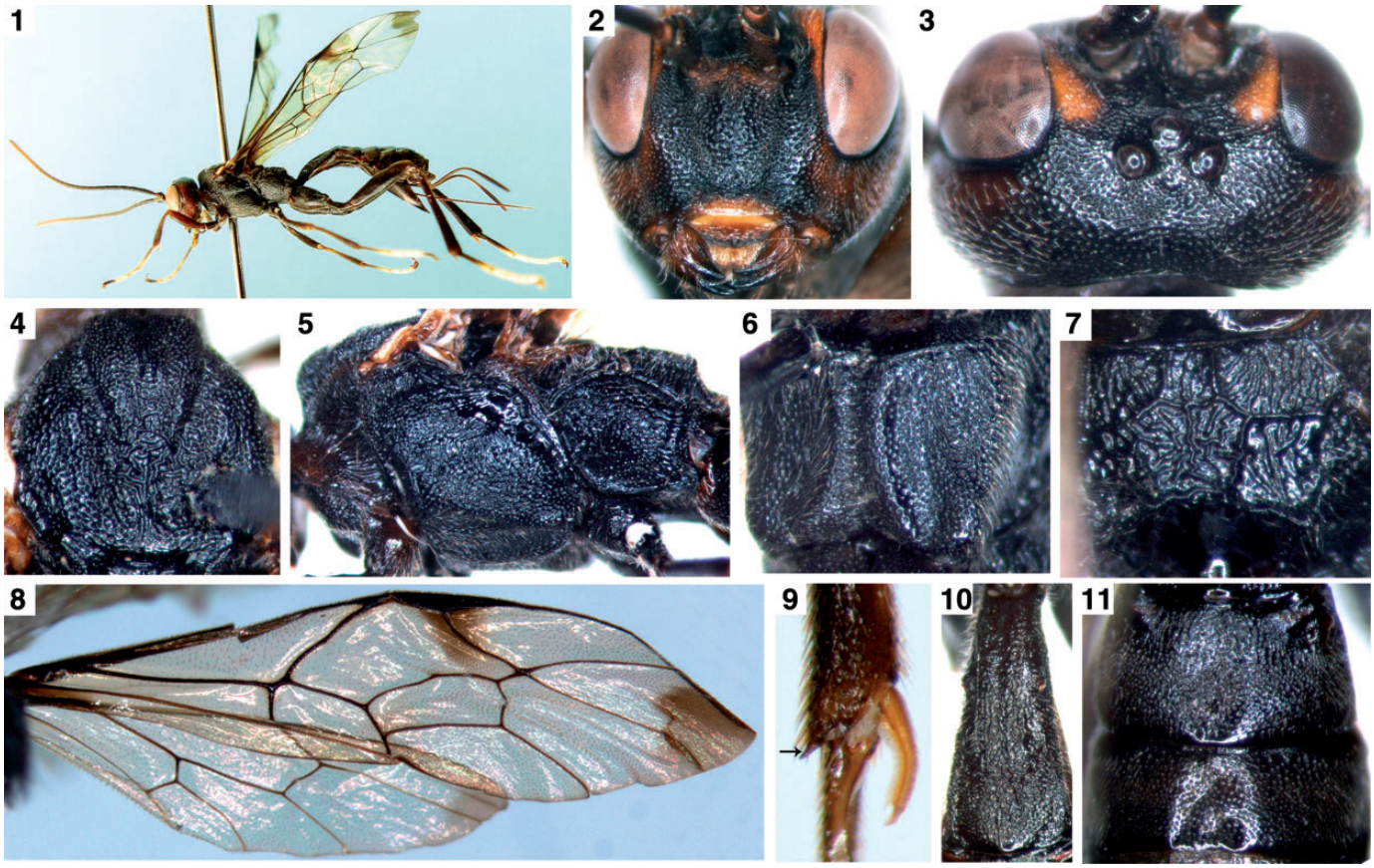
Distribution. There is a single Chinese species, described in the Description.

Etymology. The name of the new genus is based on the combination of fore wing vein rs+RS and M. The gender is feminine.

Remarks. *Combivena* may be separated from all other genera of the Acaenitinae by the combination of the following characters: 1) Clypeus without preapical transverse ridge and apicomedian tooth, 2) fore wing with vein 2rs-m disappeared, 3) fore wing 2 m-cu with one bulla, 4) all tarsal claws with an acute accessory tooth, and 5) premedian swollen part of the first sternite smooth, without hair. It is quite similar to *Arotes* Gravenhorst 1829 but can be distinguished from the latter by: apical portion of clypeus flat or slightly concave, without preapical transverse ridge; area superomedia approximately as long as wide; apex of front tibia with a strong tooth (Fig. 9); fore wing vein 2rs-m obliterated by combination of rs+RS and M (Fig. 8); 2m-cu with one bulla; and mesosternum with broad median longitudinal groove (Fig. 6). *Arotes*:

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Figs. 1–11. *Combivena sulcata* Sheng & Sun, gen. and sp.n., Female. Holotype. (1) Body, lateral view. (2) Head, anterior view. (3) Head, dorsal view. (4) Mesoscutum. (5) Mesopleuron. (6) Mesosternum. (7) Propodeum. (8) Wings. (9) Apex of front tibia and base of first tarsomere. (10) First tergum. (11) Second to third terga.

clypeus with preapical transverse ridge; area superomedia longer than wide; apex of front tibia without tooth; fore wing vein 2rs-m distal of 2m-cu by 0.3–0.8 its length; 2m-cu with two bullae; and mesosternum normal, without broad median longitudinal groove.

Combivena sulcata Sheng & Sun, sp.n. (Figs. 1–11).

Etymology. The name of the new species is based on the median longitudinal groove of mesosternum.

Type Material. Holotype, female, China: Beishan Forest Farm, 2,366 m, Huzhu County, Qinghai Province, 7 June 2010, leg. Mao-Ling Sheng.

Description. Female. Body length ∼11.0 mm. Fore wing length ∼10.0 mm. Ovipositor sheath length ∼4.5 mm.

Head. Face ∼1.5× as wide as long, with dense punctures (Fig. 2), a "U-shaped" depression from lateral portion of antennal sockets to lower median portion of face; in "U-shaped" depression rough, with indistinct punctures; upper-lateral portions below antennal sockets and lower lateral portions above clypeal foveae with short, indistinct, transverse wrinkles. Upper lateral margin between antennal socket and eye deeply, longitudinally concave. Clypeal foveae small, almost circular, closed. Clypeus with subbasal transverse ridge, between ridge and clypeal suture densely, indistinctly punctate, nearly smooth between ridge and median portion; apical half smooth and shining, slightly rough near apical margin; and apical margin thin, even arched forward. Labrum crescentic ∼0.4× as long as wide, with short, brown hairs. Mandible with distinct longitudinal lines; lower tooth ∼2.2× as long as upper tooth. Cheek with texture as that of face, with weak subocular sulcus. Malar space ∼1.2× as long as basal width of mandible. Gena almost shining, in lateral view ∼1.2× as long as width of eye, with dense, distinct punctures, distance between punctures 0.2–2.5× diameter of puncture. Vertex (Fig. 3) with dense elongate punctures, denser than that of face. Lateral margin of lateral ocellus concave. Postero-ocellar line ∼0.7× as long as ocularocellar line. Frons deeply concave, with dense transverse wrinkles; lateral margin more convex, with indistinct fine punctures. Antenna ∼7.5 mm, with 27 flagellomeres; apical truncations of basal nine flagellomeres sloping. Ratio of length of flagellomere 1:2:3:4:5 is 6.0:4.0:3.7:3.5:3.4. Occipital carina medially evenly arched upward.

Mesosoma. Pronotum with dense, distinct, sloping wrinkles; anterior and upper-posterior margins with dense indistinct punctures. Epomia short, laying aboard upper margin of pronotum. Propleuron with dense transverse wrinkles. Mesoscutum (Fig. 4) with dense punctures, distance between punctures 0.2 and 0.5× diameter of puncture; median portion of posterior 1/3 with irregular wrinkles. Notaulus very strong, reaching to posterior 1/3 of mesoscutum. Hind margin of mesoscutum almost vertical. Scutoscutellar groove with oblique wrinkles and a median longitudinal ridge. Scutellum with dense punctures, subposterior portion more convex. Postscutellum smooth, shining, lateral margin with fine, indistinct punctures, posterior portion evenly oblique, anterior-lateral portion deeply concave. Upper-anterior portion of mesopleuron (Fig. 8) with distinct punctures, lower portion rough, with irregular punctures, punctures in the middle strongly coalescent appearing to be ruguloso-punctate; below subalar prominence with short longitudinal wrinkles; in front of speculum with oblique transverse wrinkles, below speculum with longitudinal wrinkles. Speculum shining, with fine transverse lines. Upper end of epicnemial carina approximately reaching level of 3/5 of front margin of mesopleuron, comparatively far distant from front margin. Mesosternum (Fig. 6) indistinctly punctate, submedian portion longitudinally convex. Metapleuron rough, with irregular reticulate wrinkles. Without

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juxtacoxal carina. Submetapleural carina complete. Wings slightly brownish, hyaline, apical portions, and below stigma smoky gray. Fore wing (Fig. 8) with vein 1cu-a basal of 1/M ~0.4× as long as 1cu-a. 2-Cu ~1.6× as long as 2cu-a. Hind wing vein 1-cu ~0.7× as long as cu-a. Middle and hind coxae and femora with dense punctures. Basal portion of outer side of hind coxa concave, smooth, and shining. Ratio of length of hind tarsomeres 1:2:3:4:5 is 11.0:4.2:3.3:2.2:4.8. All claws with median tooth on mesal side. Propodeum (Fig. 7) completely areolated. Area basalis slightly longer than width, lateral carinae parallel. Area superomedia hexagonal, costula connecting approximately at its anterior 0.3. Areas basalis and dentipara with irregular oblique longitudinal wrinkles. Areas superomedia with stelliform wrinkles. Anterior portion of area externa and area lateralis rough, with dense, reticular, indistinct wrinkles. Posterior portion of area externa with distinct longitudinal wrinkles. Area petiolaris smooth, shining. Propodeal spiracle slanting, elongate, ~2.0× longer than width.

Metasoma. First tergum (Fig. 10) weakly, evenly narrow toward base, ~1.9× as long as apical width, rough, with short, irregular wrinkles; median dorsal carinae present from base to median portion; medianly longitudinally retuse; and basal portion of dorsolateral carina present, subapical portion weakly ridge shaped. Spiracle slightly convex, at anterior 0.4 of first tergum. Second tergum (Fig. 11) ~0.55× as long as apical width, with weak median longitudinal concavity; slightly rough, with dense indistinct punctures, basal portion with short, indistinct longitudinal wrinkles. Third tergum slightly shining, ~0.4× as long as apical width, with distinct punctures, distance between punctures 0.5 and 2.0× diameter of puncture. Fourth to sixth terga with short brown hairs. Fourth tergum with texture as that of third tergum but punctures finer than that on third tergum. Seventh tergum flexible. Apex of hypopygium evidently projecting beyond tip of metasoma. Ovipositor sheath approximately as long as hind tibia. Ovipositor thin, apical portion of ventral valve with weak, unclear longitudinal ridges.

Color (Fig. 1). Black, except the following: upper margin of face, inner orbit, cheek, median portion of mandible, and main portion of gena asymmetrically brown to darkish brown. Clypeus yellowish brown. Basal portion of antenna black, apical brown. Fore and mid femora, lateromedian portion of pronotum faintly darkish brown. Ventral profiles of fore and mid tibiae buff. Tegulae, apical portions of first tarsomeres, second to fourth and base of fifth tarsomeres (hind fifth entirely) white. Stigma and veins brownish black.

Remarks. *Combivena sulcata* can be recognized by the following combination of characters. Face with a "U-shaped" depression from lateral portion of antennal sockets to lower-median portion of face. Clypeus with subbasal transverse ridge, apical half smooth, and shining. Lower tooth of mandible ~2.2× as long as upper tooth. Frons with dense transverse wrinkles. Scutoscutellar groove with oblique wrinkles and a median longitudinal ridge. Lateral carinae of area basalis parallel. Apex of hypopygium evidently projecting beyond tip of metasoma. Apical portions of wings and below stigma smoky-gray. Tegulae and hind tarsomeres 2–5 white.

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