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A New Tribe, a New Genus, and a New Species of the Subfamily Dictyopharinae (Homoptera, Dictyopharidae) from Chile

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Abstract—*Rancoda rakitovi* gen. et sp. n. is described from Chile (the La Campana National Park, Valparaiso Region), for which a new monotypical tribe Rancodini trib. n. is established in the subfamily Dictyopharinae. The characteristic features of the new tribe are sharp brachyptery (the orgerioid habitus), the presence of sensory pits in the adults, two spines in the inner group on the apex of the hind tibia, a simple median carina on the abdominal tergites, and the straight margin between the metope and the clypeus. Similarity between the advanced representatives of the subfamily Orgeriinae (sensory pits in the adults) is convergent and is combined with the primitive characters which are absent in all the Orgeriinae but present in the Dictyopharinae.

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During the expedition of a group of researchers of the Paleontological Institute of the Russian Academy of Sciences headed by D.E. Shcherbakov and with my participation, R.A. Rakitov, to whom I am very grateful, found a new rather peculiar representative of the family Dictyopharidae, *Rancoda rakitovi* gen. et sp. n., which should be separated in the new tribe Rancodini trib. n. *R. rakitovi* differs from the other members of the subfamily Dictyopharinae in the extreme degree of brachyptery and in the presence of sensory pits in the adults; in these characters, the new genus and the new tribe are very similar to the representatives of the tribes Almanini and Orgeriini of the subfamily Orgeriinae. The paucity of material (1 ♂ and 1 ♀) does not allow me to carry out complete analysis of the characters of the group described, but even the main external characters accessible without dissection show that the new tribe cannot be attributed to the subfamily Orgeriinae (see comparative notes).

The types of the species described here are deposited in the collection of the Zoological Institute, the Russian Academy of Sciences, St. Petersburg.

Tribe **RANCODINI** Emeljanov, trib. n.

Type genus *Rancoda* gen. n.

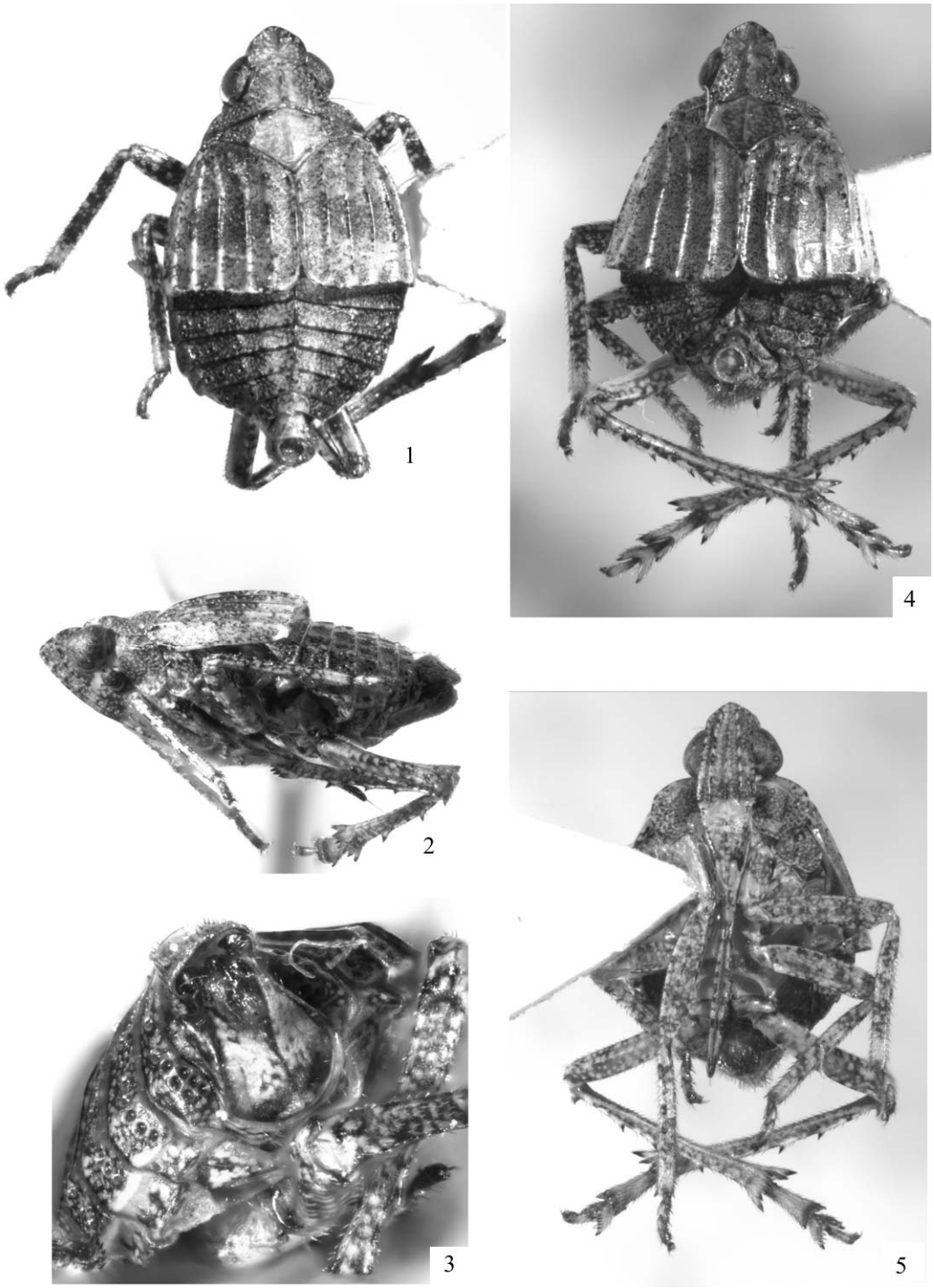
Description. Head rather small; coryphe pentagonal, about as long as wide; metope rather narrow, with all 5 its carinae well developed. Border between metope and clypeus nearly straight; epiclypeal lobes rudimentary. Tegmina strongly shortened, truncate posteriorly, terminating above abdominal tergite III. Tegulae rudimentary, concealed by posterior margin of pronotum. Fore coxa with simple (not foliaceous) anterior carina. Fore femur with obtuse-angled projection at posterior margin before apex. Apex of hind tibia only with 2 spines in posterior (inner) group. Median carina on abdominal tergites simple. Styli elongate, their basal halves lying in deep emargination of pygofer; their lower margins closed in basal half, diverging in distal half. Ovipositor subconical; basal plates of first valvulae smooth, flat, forming common surface with valvifers. Metope, pronotum, scutellum, and abdominal tergites with sensory pits. Abdominal tergite VIII characterized by presence of median pit similar to those on preceding segments. Subcostal carina of tegmina projecting on their posterior margin, slightly before anterior corner.

In Emeljanov's (2011) key to the tribes, Rancodini falls on couplet 25—Cleotychini, from which it differs in the presence of sensory pits in the adults and in a simple (non-foliaceous) lateral carina of the fore coxa (see comparative notes).

Genus ***Rancoda*** Emeljanov, gen. n.

Type species *Rancoda rakitovi* sp. n.

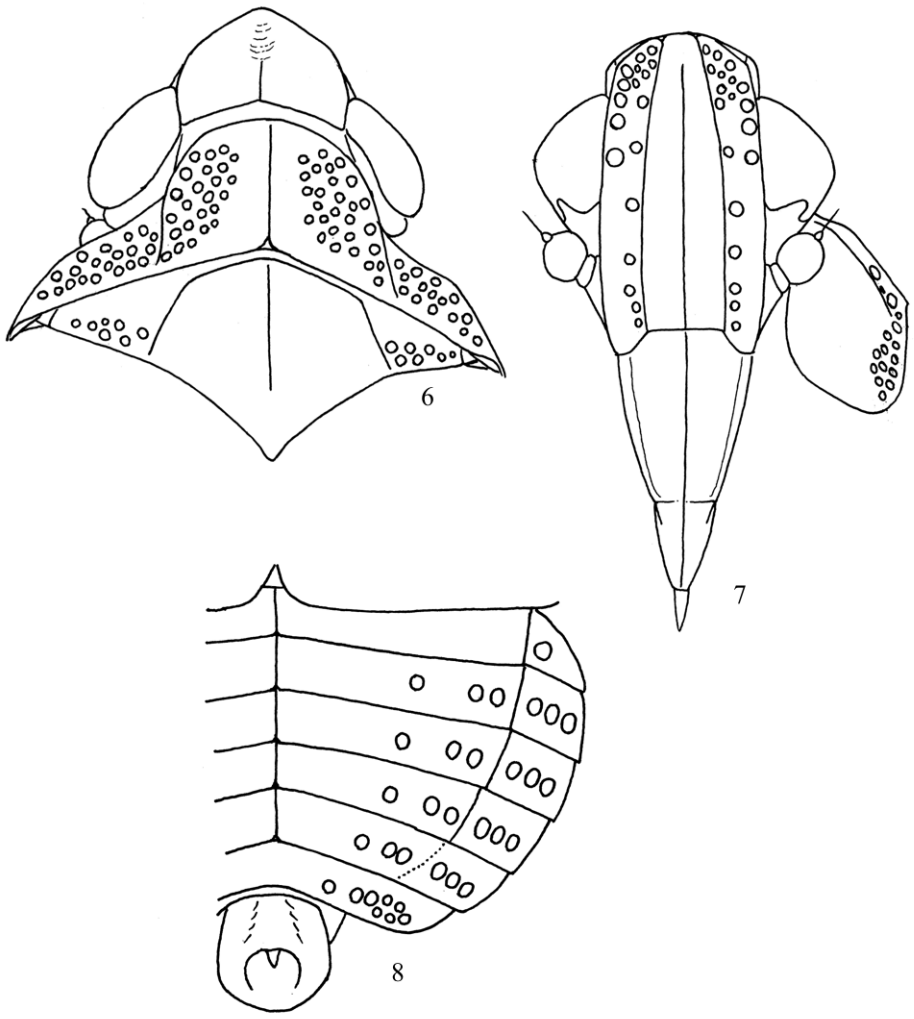
Description. Habitus orgerioid (Figs. 1, 2, 4, 5), most similar to those of South-African representatives of the genera *Codon* Fenn. and *Strongylodemas* Stål



Figs. 1–5. *Rancoda rakitovi* gen. et sp. n., male, holotype (1–3) and female (4, 5): (1, 4) general dorsal view; (2) general lateral view; (3) apex of abdomen, oblique posterior view; (5) general ventral view (photographs by D.M. Astakhov).

(Fulgoridae, Strongylodematinae), but in these species, clypeus deeply running into metope as narrow cusp.

Integument coarsely scabrous, rather uneven. Head short, moderately projecting beyond eyes. Coryphe pentagonal (Fig. 6), nearly as long as wide; lateral margins converging anteriorly; apical margins converging at about right angle; posterior margin shallowly concave. Surface uneven, generally slightly concave; carinae sharp, posterior one smoothened; unsharp keel-shaped formation crossing coryphe; in front of this formation, shallow longitudinal groove extending along middle line. Posterior margin of cory-



Figs. 6–8. *Rancoda rakitovi* gen. et sp. n., arrangement of sensory pits: (6) anterior part of body, dorsal view; (7) head (face) and paranotal lobe of pronotum; (8) abdomen, dorsal view, lateral areas of tergites deflexed upwards to show pits.

phe situated at level of middle of eyes. Coryphe moderately inclined forwards. Metope (Fig. 7) attached to coryphe at nearly right angle, about 2.5 times as long as wide, slightly narrowed towards coryphe; its lateral carinae very weakly arcuately convex; intermediate carinae straight, converging upwards (towards coryphe), minimum distance between them slightly shorter than distance from each of them to lateral carina. Lateral and intermediate carinae of metope sharp, high; median carina sharp in lower half, smoothened upwards. Slightly indistinct oblique carina bounding narrow trigone below anterolateral margin of coryphe above dorsal pits (of outer areas) of metope. In cross-section, metope weakly convex, with lateral lobes slightly deflexed sideway. Clypeal margin of metope mostly straight, limited laterally by small, weakly projecting epiclypeal lobes. Lateral lobes of metope with sensory pits arranged in 2 rows (Fig. 7); in median row, sensory pits large, widely spaced, except for 2 smaller upper pits (7 + 2) belonging to apical congestion including accessory pits filling space between main pits. Three lower large pits also approximate, 2nd (from clypeus) pit as though inserted into interval between 1st and 3rd pits, this interval similar to that between 4–6th pits; outer row pronounced only in upper part of metope between eyes, beginning with 6th pit of inner row, and turning into irregular, tentatively three-rowed congestion because of occurrence of several smaller pits described above. Postclypeus about half as long as metope, in shape of truncate wedge; its lateral carinae converging towards anteclypeus; middle and lateral carinae sharp, similar to those on metope; median carina continued on anteclypeus and reaching its apex; lateral carinae slightly passing onto

anteclypeus and vanishing. Rostrum long (Fig. 5), its penultimate segment projecting slightly beyond apices of hind coxae; ultimate segment nearly half as long as penultimate one, reaching base of genitalia. Antenna small; 1st segment short, ring-shaped; 2nd subspherical. Pronotum (Fig. 6) with slightly undulate, nearly straight posterior margin shallowly concave in middle and convex at sides of disc. Disc slightly longitudinally elongate, semi-oval, nearly semicircular, with sharp median carina and with lateral carinae slightly diverging posteriorly and weakening towards posterior margin. Sides of pronotum with two carinae. Lateral quarters of disc filled with sensory pits: up to 4 on transverse line; lateral lobes of pronotum entirely covered with sensory pits (arranged in about 4 rows); humeral area with 2 sensory pits; posterior part of paranotal lobes with 2 vertical rows each consisting of 4 or 5 sensory pits and with 1–3 accessory rows in front of vertical rows (Fig. 7). Scutellum (Figs. 6) transverse, with sharp carinae; lateral carinae connected anteriorly by transverse carina; posterolateral margins forming obtuse angle with each other; apex of scutellum slightly attenuate; lateral lobes with about 7 sensory pits arranged in 2 rows. Tegmina strongly shortened, transversely truncate posteriorly, entirely covering only 2 basal abdominal tergites; posterior margins of tegmina forming very obtuse convex angle. Tegulae rudimentary, concealed by margin of pronotum. Tegmina covered with even rib-shaped longitudinal carinae curved only at base of wing; carinae corresponding to stems *ScR*, *M*, *CuA*, *CuP* and *A1*; last carina running in parallel to sutural margin, others, from base of wing. Costal areas nearly vertically turned onto sides. Legs rather short, not widened; anterior carina of fore coxa simple, non-foliaceous, without apical projection; posterior carinae of fore femur with unsharp obtuse-angled projection before apex. Hind tibia with 4 or 5 lateral teeth in female and with 4 teeth in male; apex of hind tibia with 7 or 8 spines; posterior group including only 2 spines: anterior one longer than other. Hind tarsus rather short; 2nd tarsomere short; apical teeth on 1st and 2nd tarsomeres small, abundant, all (except for marginal ones) with subapical setae (platellae?). Abdomen (Fig. 8) with sharp sublateral and distinct intermediate carinae; median carina also sharp, simple. Lateral areas on tergite III with 1 sensory pit, those on tergites IV–VII with 3, less rarely with 4 pits; lateral carina on tergite VII vague; tergite VIII without lateral carina, with pits of intermediate and lateral areas forming unified whole; on tergites III–VIII, intermediate area with 1 + 2 sensory pits, median pits sitting on inconspicuous intermediate carina and interrupting it. Male and female genitalia not dissected.

Male. Pygofer without sharp projections; lower wall forming deep posterior emargination enveloping basal halves of elongate styli; styli closed in basal half, diverging in distal half, with narrowly rounded apices, without teeth (neither lateral, nor upper). Anal tube (Fig. 3) rounded, short, wide.

Female. Genitalia on whole shortly conical, similar to those in Ommatidiotinae (Caliscelidae). Anal tube wide, rounded.

Rancoda rakitovi Emeljanov, sp. n. (Figs. 1–8)

Description. General coloration gray with alternation of darker and paler areas combined with black spots. Coryphe with 2 dark small spots opposite middles of anterior margins. Metope spotted, more densely spotted on lateral areas; epiclypeal part of metope with diffuse dark transverse band. Postclypeus pale in basal half, dark distally together with anteclypeus; preocular area, genae at sides of antennae and distally, and also lora with dark spots; antennae entirely dark brown. Rostrum nearly black, subapical segment with pale spots. Pronotum and scutellum darker in area of sensory pits, pale beyond them in median part. Tegmina gray; male tegmina with pale carinae, median part with distinct dark band extending also onto veins; female tegmina almost uniformly gray-spotted, veins weakly paler, but traces of band appearing as weak darkening of area occupied by band in male. Thorax dark, with pale spots. Lateral parts of anteclypeus and adjacent apices of middle coxae paler. Legs almost regularly covered with dark spots. Abdomen also covered with mainly merged spots; in male, indistinct paler paired longitudinal stripe running laterally from median carina to intermediate one.

Body length 4.3 mm in male, 4.1 mm in female; female abdomen wrinkled.

Material. Chile, Region de Valparaiso, Parque National La Campana, 19.XII.2013, 1 ♂—holotype, 1 ♀ (not entirely mature) (R. Rakitov).

Comparative notes. According to the presence of sensory pits in the adults, it would be well to place *Rancoda* (and Rancodini) in the subfamily Orgeriinae; however, the new tribe possesses a contrasting set of advanced and primitive characters preventing its attri-

bution to this subfamily: the presence of sensory pits in the adults is combined with the persisting tegulae and with a simple median carina of the abdomen; this is the manifestation of the phenomenon of heterobathmy.

Arrangement of sensory pits on tergites VI–VIII, which bear wax areas in the nymphs of Dictyopharidae, differs between the subfamilies Dictyopharinae and Orgeriinae; it also differs in different tribes of the subfamily Dictyopharinae (for which the nymphs were examined) (Wilson and McPherson, 1981; Emeljanov, 1993, 1994; Yang, Yeh, 1994; McPherson and Wilson, 1995). In the subfamily Dictyopharinae subdivided into 13 tribes (Emeljanov, 2011), the nymphs remain unknown only for the tribes Cleotychini and Capenini. I have at my disposal undescribed nymphs (5th instar) from the tribes Hastini (*Niculda*) and Lappidini (*Lappida*) and examples from all the others, except for the two mentioned. The uniform arrangement of the sensory pits in the lateral area on all the tergites, on which they are present, is a peculiar character of Rancodini and it never occurs in Orgeriinae.

Ranissini, the basic tribe of the subfamily Orgeriinae, lacks sensory pits at the adult stage, but possesses an enlarged postclypeus running into the metope (Emeljanov, 1969, 1980, 2001). In Rancodini, the clypeus slightly runs into the metope, and the epiclypeal lobes are short. The rudimentary tegulae concealed under the pronotal margin persist. Also, all the Orgeriinae are characterized by the transverse linear arrangement of both the sensory pits on the mesonotum at the sides of the lateral carinae of the scutellum in the adults and the homological carinae of the mesonotum in the nymphs; the pits, usually the 3rd one, occasionally double in the longitudinal direction, but the general transverse linear arrangement always remains distinct (Emeljanov, 1980). In the subfamily Dictyopharinae, this group of pits (in the 5th instar nymph) mainly forms more than 2 rows along the longitudinal axis of the body (Emeljanov, 1994); the arrangement of scutellar pits in Rancodini is double-rowed, differs from that typical of both the Dictyopharinae and the Orgeriinae. An important character of Rancodini is, as mentioned above, the entire uniformity of the arrangement of pits on tergites IV–VIII, while in nearly all the representatives of Dictyopharidae (in the nymphs), the median pit on tergite VIII is absent, except in some Orthopagini (Emeljanov and Shcherbakov, 2011), but in other respects, the arrangement of the sensory pits in these tribes differs, and, obviously the occurrence of the median pit in these two tribes should be considered independent. The median pit on tergite VIII may be pronounced in the mid-instar nymphs of *Dictyophara* (Dictyopharini), but disappears at the advanced instars. The number and arrangement of pits in the adults of *Rancoda* are similar to those in the 1st instar nymphs of *Dictyophara* (except on tergite VIII). Rancodini also differs from the tribes of the subfamily Orgeriinae, possessing sensory pits at the adult stage (Orgeriini, Almanini) in the non-foliaceous anterior pecten of the fore coxa and in the simple, instead of double, median carina on the abdominal tergites. In view of the foregoing, it can be concluded that the orgerioid habitus of the tribe Rancodini (including the presence of sensory pits at the adult stage) originated independently, and the tribe should be included in the subfamily Dictyopharinae. More substantiated and comprehensive analysis requires examination of additional material.

In addition to the brachyptery and the presence of trigones, the tribes Rancodini and Cleotychini are similar in the posterior group at the apex of the hind tibia consisting of only 2 spines (of 3 spines in the other Dictyopharidae). The other characters of these tribes have little in common. In Cleotychini, though the tegulae are absent, but sensory pits are also absent; the body is not flattened dorsoventrally; and the fore tibia is foliaceously widened. There is also no clear proof that the sharp brachyptery of these two tribes is an inheritance from their common ancestor. The intraspecific polymorphism in the wing length, usually manifested as dimorphism (a common property of all the cicadas, latently persisting in nearly all the monomorphically macropterous species) is a low-weight homoplasy. The presence of 2 spines in the posterior group at the apex of the hind tibia is also a character with a high homoplastic potential, since it can easily occur in the adults as the result of differentiation (retardation) at the mid-instar larval stages (see, i.e., Emeljanov, 2001).

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