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A Review of the Orgeriinae (Homoptera, Dictyopharidae) Fauna of Iran with Description of New Species

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Abstract—A review and a list of eleven Iranian species of the subfamily Orgeriinae are given. Two new species are described, keys to the genera and species are provided. All the known localities are listed and mapped. Four species, including two new ones, are described in the Iranian fauna for the first time.

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The Orgeriinae fauna of Iran still remains poorly studied. The first representative of Orgeriinae from Iran, *Nymphorgerius convergens* Em., was described in 1972 (Emeljanov, 1972). At present, 7 species have been recorded from Iran: *N. convergens* Em., *N. plotnikovi* Kusn., *N. mullah* Dlab., *N. emeljanovi* Dlab., *N. rostratus* Em., *Tigrahauda ototettigoides* (Osh.), and *Kumlika mandrita* Em. (Emeljanov, 1972, 1997, 2009; Dlabola, 1979). In the present paper, 4 more species are described based on the material examined: 2 new (*N. curvinaso* sp. n. and *N. melleus* sp. n.) and 2 already known (*N. transcaucasicus* Sid. and *N. armeniacus* Em.) species. In all, the Iranian fauna includes 11 species of Orgeriinae. Three more species may also be recorded in Iran, since they were found near the Iranian borders: *Scirtophaca bungei* Em. known from the Arax River valley in Nakhichevan and *N. hovarthi* Osh. and *N. eburneolus* Em. found in Badkhyz, Turkmenistan.

The type specimens of the new and redescribed species are deposited in the following institutes and museums: HMIM, Hayk Mirzayans Insect Museum, Iranian Research Institute of Plant Protection, Tehran, Iran; HNHM, Hungarian Natural History Museum, Budapest, Hungary; NMWC, National Museum of Wales, Cardiff, Great Britain; ZIN, Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia.

A Key to the Genera of the Subfamily Orgeriinae of Iran

1 (4). Apical callus about as long as wide, not elongate to form carina; intermediate carinae of metope connected at apex of coryphe. Teeth at apex of hind tibia forming no regular arc (in view along tibia axis): 3rd tooth from inner (posterior) margin of tibia shifted towards axis of tibia.

2 (3). Abdominal tergite III without sensory pits. Humeral sensory pits on sides of pronotum more numerous than pectoral pits. Claws with 3 setae ..... *Nymphorgerius* Oshanin.

3 (2). Abdominal tergite III with sensory pits. Pectoral sensory pits on sides of pronotum more numerous than humeral pits. Claws with no more than 2 setae ..... *Tigrahauda* Oshanin (in Iran 1 species—*T. ototettigoides* Oshanin).

4 (1). Apical callus transformed into carina, point of connection of intermediate carinae of metope distant from apex of coryphe. Teeth at apices of hind tibiae forming regular arc in view along axis of tibia ..... *Kumlika* Oshanin (in Iran 1 species—*K. mandrita* Emeljanov).

A Key to the Species of the Genus Nymphorgerius of Iran and the Near East

1 (20). Subcostal elytral carina absent at all or at least in posterior half (Subgenus *Isocurus* Em.).

2 (7). Mammoids not developed. Abdominal tergites IV and V with 3 pits at either side. Metope without epiclypeal sensory pits.

3 (4). Metope more or less straight in lateral view, head moderately projecting forwards ..... *N. melleus* sp. n.

4 (3). Metope concave in lateral view; apex of head projecting far forwards, hook-shaped since coryphe convex in lateral view.

5 (6). Length of part of cephalic process, projecting ahead of eye, no more than 1.5 times longitudinal eye diameter (in lateral view) .... *N. curvinaso* sp. n.

6 (5). Length of part of cephalic process, projecting ahead of eyes, at least twice longitudinal eye diameter (in lateral view) ..... *N. rostratus* Em.

7 (2). Mammoids developed. Abdominal tergites IV and V with 4 pits at either side. Metope with epiclypeal sensory pit.

8 (17). Humeral area of pronotum with 2 pits.

9 (14). Blackened area on mammoids continuous.

10 (11). Elytra with reticulate pattern .... *N. emeljanovi* Dlab.

11 (10). Elytra uniformly black to brown.

12 (13). Upper part of postclypeus entirely blackened; lower part pale, with more or less developed yellow oblique stripes. Lower margins of paranotal lobes of pronotum pale .... *N. transcaucasicus* Sid.

13 (12). Postclypeus entirely black. Paranotal lobes of pronotum entirely black, only with marginal carina slightly paler ..... *N. mullah* Dlab.

14 (9). Blackened area on mammoids with deep pale emargination.

15 (16). Coryphe and upper part of face with yellow specks ..... *N. armeniacus* Em.

16 (15). Coryphe and upper part of face regularly pale ..... *N. balchanicus* Em.

17 (8). Humeral area of pronotum with more than 2 pits.

18 (19). Pectoral area of pronotum with only 1 pit ..... *N. curticeps* Lnv.

19 (18). Pectoral area of pronotum with 2 or 3 pits .... *N. gemmatus* Horv.

20 (1). Subcostal elytral carina reaching posterior margin of elytra (subgenus *Nymphorgerius* s. str.).

21 (22). Postclypeus not swollen, with sides parallel below epiclypeal lobes ..... *N. convergens* Em.

22 (21). Postclypeus swollen, with sides slightly approximate downwards below epiclypeal lobes ..... *N. plotnikovi* Kusn.

Nymphorgerius melleus Emeljanov et Mozaffarian, sp. n. (Fig. 1, *3*)

Material. Holotype: ♂, Iran, Fars Province: Iran, Kohkiluyeh va Boierahmad, W slope Dena Mt [Kuh-e-Dena], 2210 m, 18–20.VIII, 1976, Borumand/Pazuki (HMIM). Paratypes: 5 ♂, 9 ♀, as holotype (HMIM 3 ♂, 6 ♀, ZIN 2 ♂, 3 ♀).

Description. Coryphe rather narrow, about 2/5 of its length projecting ahead of eyes, parallel-sided between eyes, lancet-like narrowed anteriorly towards acute-angled apex, slightly convex longitudinally (in lateral view). Metope straight in lateral view, situated in line with adjacent part of postclypeus, parallel-sided from level of middle of eyes to apex of head, widened towards clypeus; intermediate carinae parallel between eyes, diverging towards clypeus, lancet-like converging towards apex of head. Lateral carinae of metope strongly smoothened between eyes, less distinct than those in the *N. transcaucasicus* Sid. species-group (species with mammoids, see the key). Postclypeus rather flat, noticeably narrower than adjacent part of metope, its length along median line about 2/5 of metope length. Rostrum long, reaching middle part of ovipositor in females, and pygophore in males. Pronotal disc distinctly separated by lateral carinae, bearing at least 3 rows of sensory pits at either side. Posterior margin of pronotum gently convex. Humeral area of pronotum with 2 pits, pectoral area with 1 pit; paranotal lobes flat, without mammoids; postclypeus also without swollen distal area. Lateral lobes of mesonotum with 1 sensory pit. Elytra rather smooth, with traces of secondary venation; presutural carina clearly pronounced; subcostal carina visible only at base of wing or entirely smoothened. Abdominal tergites with traces of intermediate carinae projecting in form of weak smoothened prominences. Number of sensory pits on tergites: 3 on tergites IV and V (indistinctly 1 + 2), 4 on VI and VII, 4 or 5 on VIII, but outer pits belonging to lateral area, and sublateral carina (as usually) absent. Legs fine and slender, hind tibia with 4 lateral teeth, hind tarsus with 11 and 13 teeth at apices of 1st and 2nd segments, respectively.

Pale brown, with yellowish straw tint. Postclypeus in darker individuals with herring-bone brown oblique strokes; anteclypeus laterally with pair of dark stripes

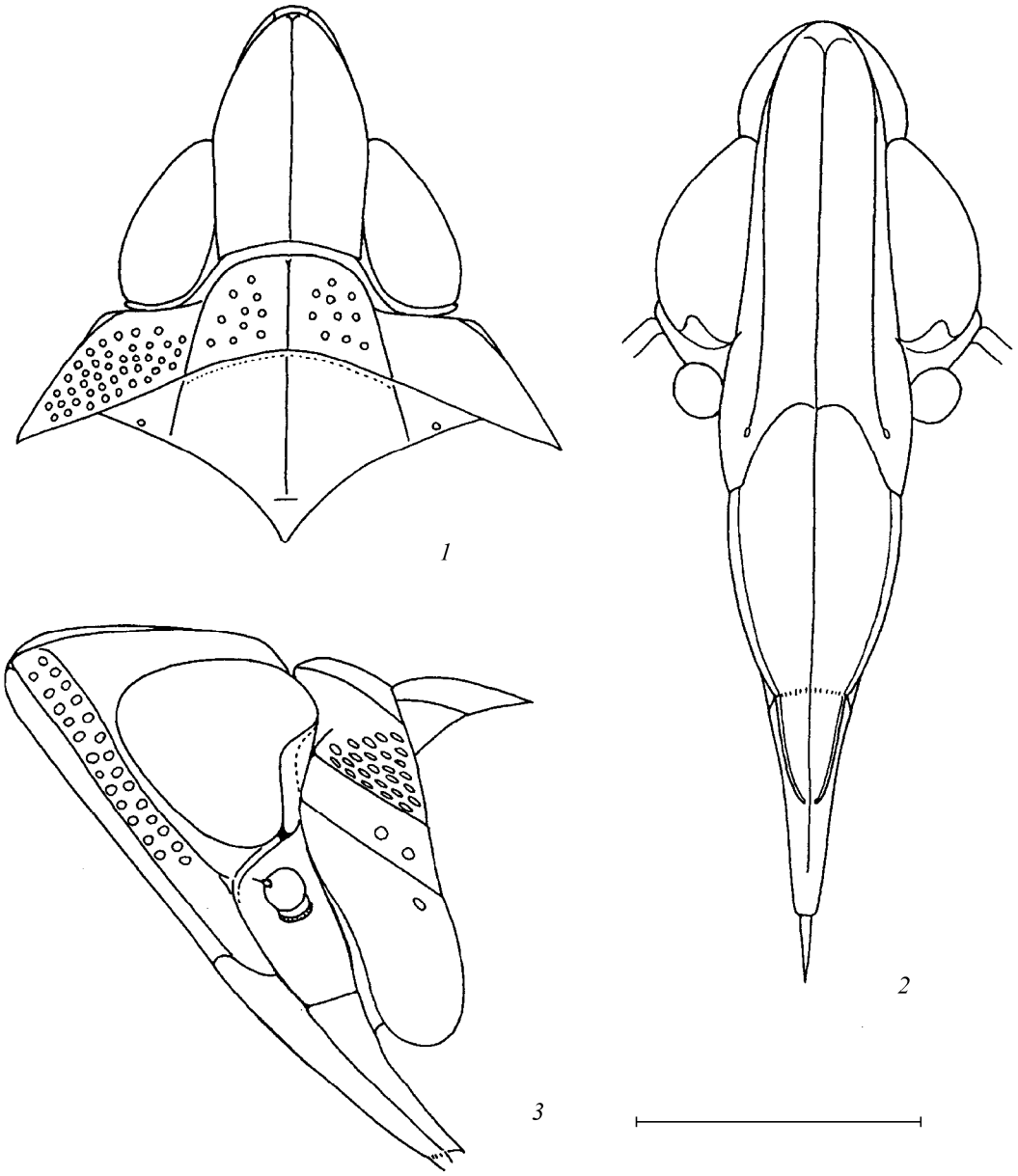

Fig. 1. *Nymphorgerius melleus* sp. n.: (*1*) anterior part of body, dorsal view; (*2*) head, fronto-ventral view; (*3*) anterior part of body, lateral view (from left). Scale 1 mm.

interrupted in middle. Rostrum with darkened apex of ultimate segment. Paranotal lobes of pronotum whitish. Mesoscutum slightly paler than pronotum. Elytra semitransparent, slightly infuscate; base of wing (at sides of stem of anterior veins) with 2 dark to black spots with vague free margins. Dorsal side of abdomen slightly reddish between carinae, abdominal segment III occasionally with brown darkened area between intermediate carinae. Tergite IX of female with black triangle posteriorly in middle, margins of lobes of 3rd ovipositor sheaths darkened from margin; inner border vague. On femora, space between carinae slightly or more strongly darkened; fore and middle tibiae also slightly darkened, but with vague band approximately in basal 3rd.

Body length 4.8–5.5 mm in males, 5.3–5.9 mm in females.

Notes. The new species is similar to *N. transcaucasicus* Sid., *N. balchanicus* Em., and *N. curticeps* Lnv. in habitus.

Nymphorgerius curvinaso Emeljanov et Mozaffarian, sp. n. (Fig. 2, *3*)

Material. Holotype: ♂: Iran, Isfahan Province: Markazi, Khomein-Delijan, 1780 m, 30.VII.1981,

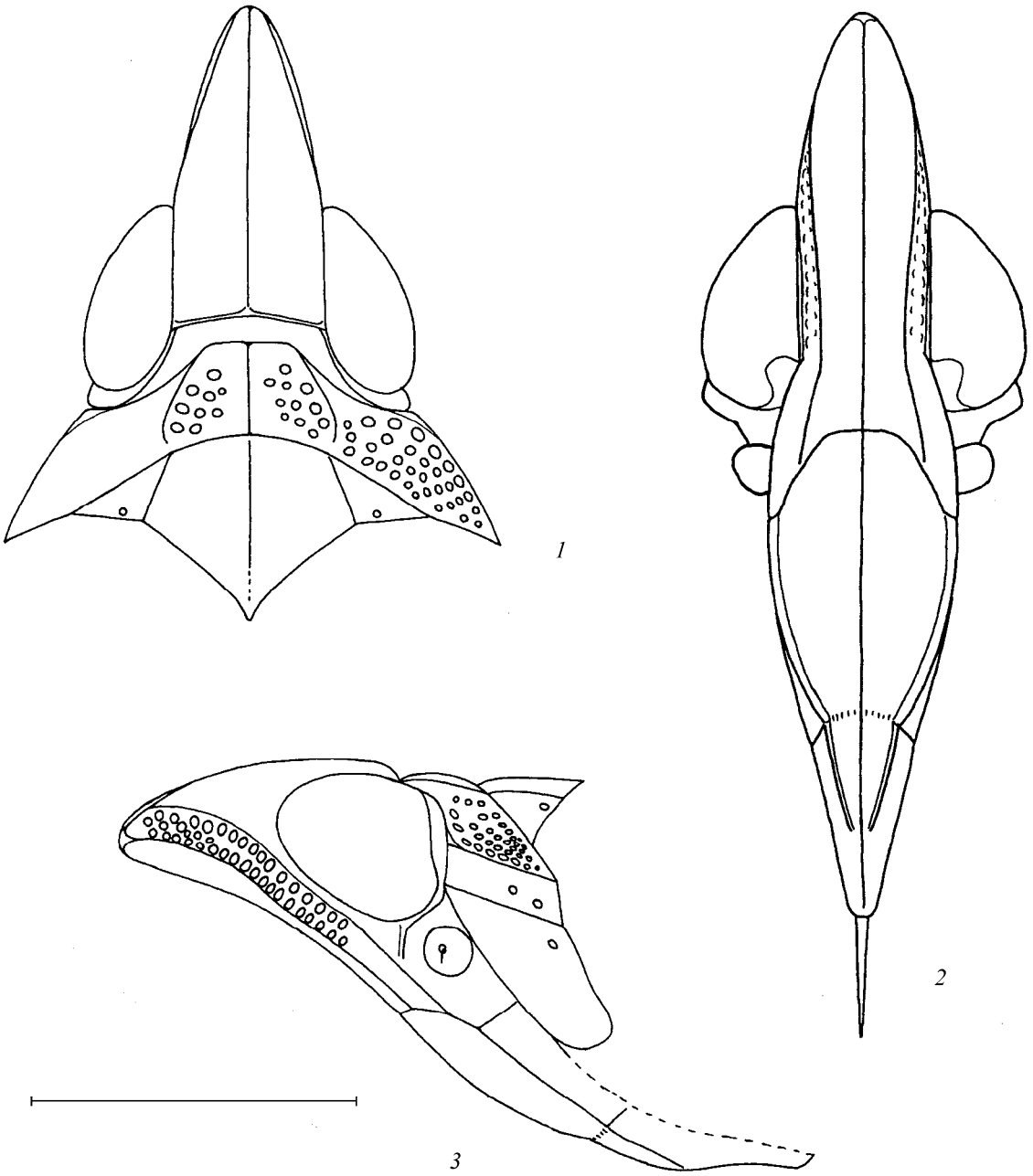

Fig. 2. *Nymphorgerius curvinaso* sp. n.: (*1*) anterior part of body, dorsal view; (*2*) head, fronto-ventral view; (*3*) anterior part of body, lateral view (from left). Scale 1 mm.

Pazuki and Borumand (HMIM). Paratype: 1 ♀, Esfahan, Golestan Khuh, 10 km S of Khansar, 2750 m, 27–29.X.2003, P. Gyulai and A. Garai (HNHM).

Description. Coryphe clearly convex in lateral view; metope concave, forming gentle S-shaped curve together with longitudinal convex clypeus. Coryphe arrow-shaped in dorsal view, about 2/3 of its length projecting ahead of eyes. Longitudinal carinae of coryphe distinct but not foliate. Lateral carinae of metope slightly narrowed from clypeus to apex of head up to level of upper margins of eyes, then lancet-like converging towards apex, and weakly narrowed at level of lower margins of eyes. Intermediate carinae of metope parallel from clypeus to about level of upper margins of eyes. Lateral carinae of metope poorly visible inwards from eyes and towards apex; post-clypeus wide, oval, transversely convex, as wide as metope in area of epiclypeal lobes. Rostrum reaching apex of genitalia. Pronotal disc distinctly separated by lateral carinae, bearing at least 3 rows of sensory pits

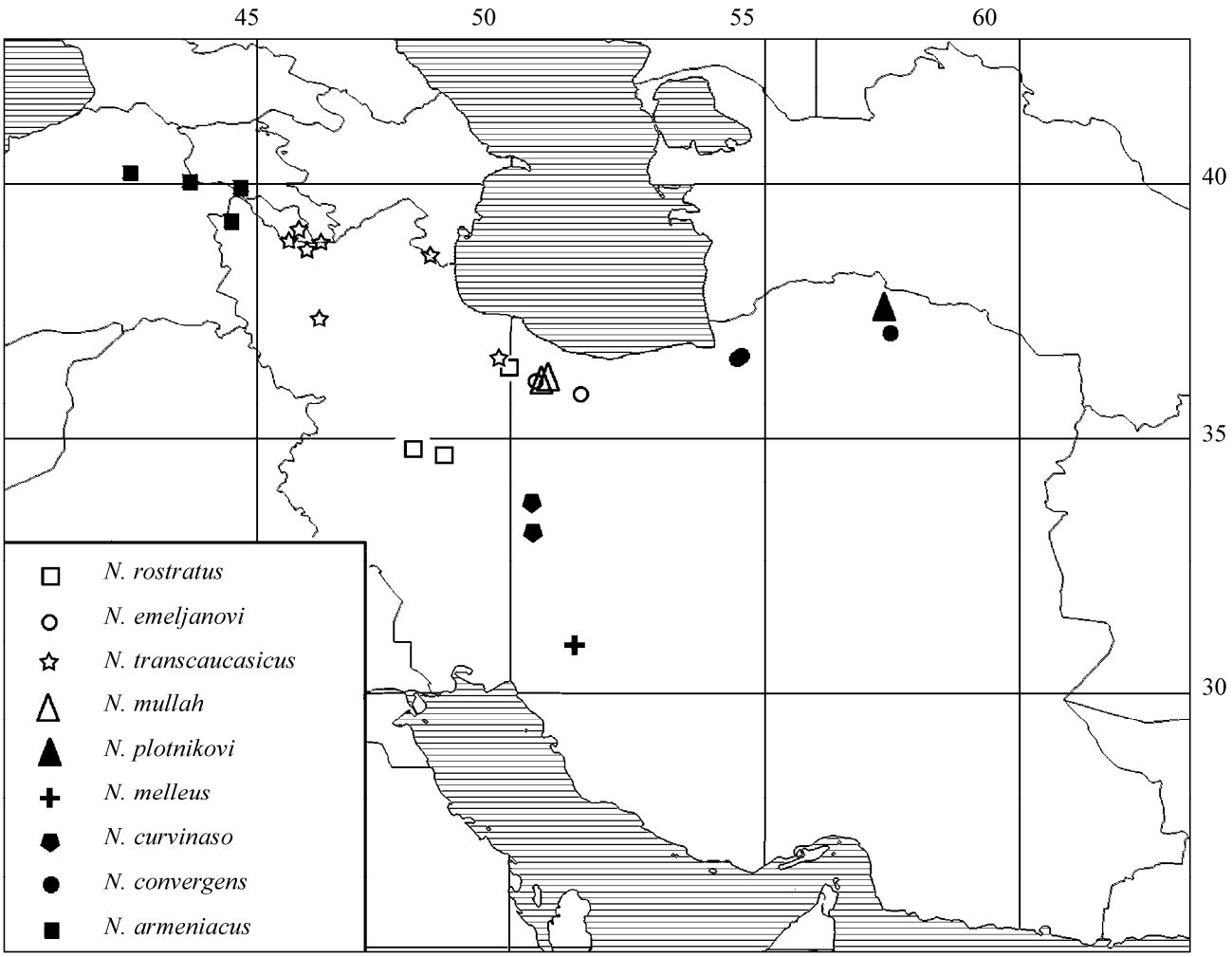

Fig. 3. Distribution of species of the genus *Nymphorgerius* Osh. in Iran and adjacent countries (the range of *N. plotnikovi* Kuzn. is shown only within Iran; the others, entirely).

at either side. Humeral area of pronotum with 2 pits, pectoral area with 1 pit; paranotal lobes flat, without mammoids. Lateral lobes of mesonotum (scutellum) with 1 sensory pit. Elytra rather smooth, with inconspicuous venation and with presutural carina among veins; subcostal carina poorly marked only at elytral base. Abdominal tergites with sharply pronounced intermediate carinae. Distribution of sensory pits over abdomen as that in *N. melleus* sp. n. Hind tibia with 4 or 5 lateral teeth, hind tarsus with 11 and 13 teeth at apices of 1st and 2nd segments, respectively.

Pale brown, with flesh-color tint. Postclypeus with brown oblique herring-bone stripes. Anteclypeus laterally with pair of reddish brown stripes interrupted in middle. Rostrum with blackened apex. Paranotal lobes of pronotum with dark specks. Elytra with pair of dark spots basally at sides of basal cell. Abdomen slightly reddish dorsally. Fore and middle femora and tibiae with merging small dark spots between carinae, spots on tibiae paler. Hind femur with yellow small spots in distal part; dorsal part darkened apically with continuous longitudinal stripes; tibiae with small spots on anterodorsal side.

Body length of male 4.6–4.7 mm.

Notes. The new species is similar to *N. rostratus* Em., but differs in the slightly shorter cephalic process; it is also similar to *N. melleus* sp. n., but its cephalic process is more elongate and clearly beak-shaped deflexed.

A List of the Orgeriinae Species of Iran and, Partly, Adjacent Countries

Nymphorgerius armeniacus Em. (Fig. 3). Iran, Western Azerbaijan Province: Azarbaijan-e Gharbi, Maku (39°17′N, 44°30′E), 1210 m, 27.VII.1976, 1 ♂,

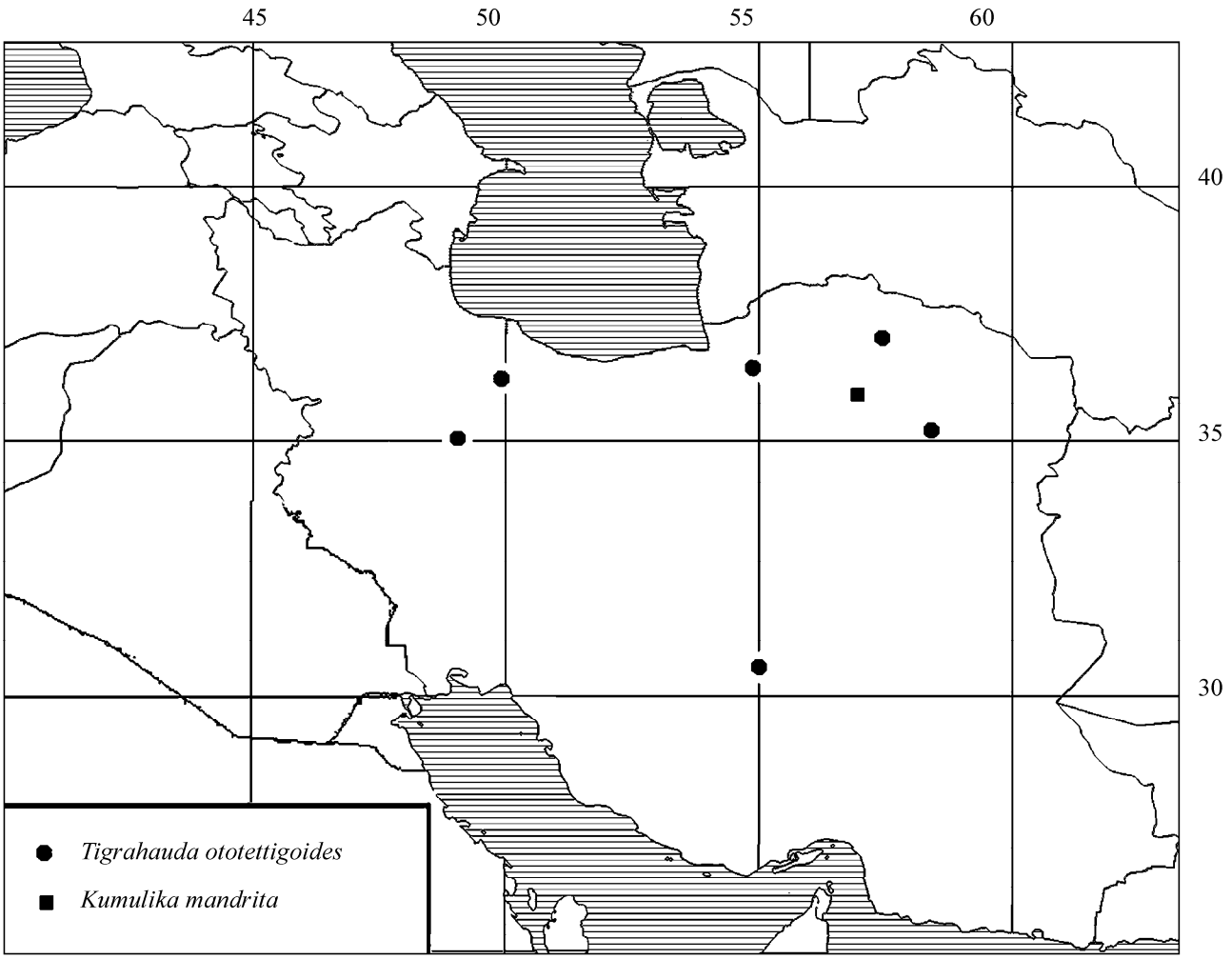

Fig. 4. Distribution of *Tigrahauda ototettigoides* Osh. in Iran and *Kumlika mandrita* Em., the only known site.

2 ♀, Borumand, Pazuki (HMIM). Armenia, environs of Vedi, 11.VII.1984 (Emeljanov, 1997). Turkey: Kars, 10 km ESE Karakurt, Arax valley, 14.VI.2001, 1 ♂, Volkovitsh (ZIN); Igdir, 9 km NW Tuzluca, Arax valley, 7.VII.2005, 1 ♂, 1 ♀, Volkovitsh (ZIN).

Nymphorgerius transcaucasicus Sid. (Fig. 3). Iran, Gilan Province, Parudbar, 29, 30.VII.2003, 1 ♀, R. & S. Linnavuori (NMWC); Azarbaijan-e Sharghi Province, Maragheh, 20–21.VII.2004, 1 ♀, R. & S. Linnavuori (NMWC). Azerbaijan, Nakhichevan: Dzhulfa, 2.VI.1931, Ryabov (ZIN); Ordubad, 25.VI.1933, Znoiko (ZIN); 5 km S of Bilav, 15.VII.1984, 1 ♂, 2 ♀, Emeljanov (ZIN); Zuvand, Tatoni, 4.VIII.1933, 1 ♀, Ryabov (ZIN). Armenia, Megri, 5.VII.1931, 1 ♂, Ryabov (ZIN); 5 km N of Megri, 17.VII.1984, 1 ♂, 2 ♀, Emeljanov (ZIN).

Nymphorgerius convergens Em. (Fig. 3). Iran, Golestan Province, Shah kouh-e Paiin, 36°34′N, 54°26′E, 5.VII.1914, A. Kiritshenko (ZIN); Golestan, Shah kouh-e Bala, 36°35′N, 54°30′E, 29–30.VI.1914, A. Kiritshenko (ZIN); Khorasan-e Shomali Province, Rishi, 20 km SE Esfarayen, 1350 m, 1 ♂, Dlabola (ZIN).

Nymphorgerius melleus sp. n. (Fig. 3). For the material, see the original description.

Nymphorgerius plotnikovi Kusn. (Fig. 3). Iran, Khorasan-e Shomali, 15 km E Bojnurd (Emeljanov, 1997).

Nymphorgerius mullah Dlab. (Fig. 3). Iran, Ghazvin, Samghabad, 36°08′N, 50°35′E, l.VIII.2006, 1 ♀, Mozaffarian (HMIM); Ghazvin, 8 km NE Ziaran, 36°07′N, 50°31′E (Dlabola, 1979).

Nymphorgerius emeljanovi Dlab. (Fig. 3). Iran, Ghazvin Province, 8 km NE Ziaran, 36°07′N, 50°31′E (Dlabola, 1979); Tehran, Tochal Mt, 35°53′N, 51°22′E (Dlabola, 1979).

Nymphorgerius rostratus Em. (Fig. 3). Iran, Hamedan Province, Arzanful, 34°39′N, 48°38′E, 29.VII.1987, 2240 m, 3 ♂, Mirzayans/Hashemi (HMIM); Hamedan, Asadabad, 34°47′N, 48°06′E, 30.VII.1987, 2200 m, 1 ♂, Mirzayans/Hashemi (HMIM); Gilan Province, Sang Rud (Sangarad), 36°39′16″N, 49°39′37″E, 29–30.VII.2003, R. & S. Linnavuori (NMWC) (Emeljanov, 2009).

Nymphorgerius curvinaso sp. n. (Fig. 3). For the material, see the original description.

Tigrahauda ototettigoides Osh. (Fig. 4). Iran, Semnan Province, Shahroud, 36°25′N, 55°01′E; Khorasan-e Shomali, Rishi, 20 km ESE Esfaraen (Emeljanov, 1997); Iran, Khorasan-e Shomali, Esfarayen, 37°05′N, 57°29′E; Iran, Khorasan-e Razavi, Kahe 30–60 km W Kashmar (Emeljanov, 1997); Iran, Khorasan-e Razavi, 30–60 km W Kashmar, 35°13′N, 58°27′E; Ghazvin Prov., Ghazvin, 36°16′N, 50°00′E; Ghom, Dasht-e Kavir, Houz-e Soltan, 3 km S Kusk-e Nosrat, 35°5′14″N, 50°55′26″E, 830 m, 28.VI.2000, 5 ♂, 1 ♀, K. Szekely (NMWC); Kerman Province: Javazm, 2000 m, 30°35′N, 55°07′E, 4.VI.2010, 2 ♂, A. Timokhov (ZIN).

Kumulika mandrita Em. (Fig. 4). Iran, Khurasan Province, Khorasan-e Razavi, Parvand, (70 km W Sabzevar), type loc. (Emeljanov, 1997).

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