

***Polydrusus nadaii* Meleshko & Korotyaev, a possible new pest for Pistachio trees in Iran (Coleoptera, Curculionidae, Entiminae)**

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Abstract. – *Polydrusus nadaii* Meleshko & Korotyaev, 2005, is recorded as a potential pest species for Pistachio trees in Iran. This is the second species of *Polydrusus* recorded damaging Pistachio trees in this country, together with *P. davatchii* Hoffmann, 1956, a well known pest species. A comparative table to differentiate these two *Polydrusus* species is given.

Résumé. – *Polydrusus nadaii* Meleshko & Korotyaev, un possible nouveau ravageur du Pistachier en Iran (Coleoptera, Curculionidae, Entiminae). *Polydrusus nadaii* est répertorié comme une espèce potentiellement ravageuse infestant le Pistachier en Iran. C'est la deuxième espèce de *Polydrusus* connue pour endommager les pistachiers dans ce pays, avec *P. davatchii* Hoffmann, 1956, espèce ravageuse bien connue. Un tableau comparatif est donné afin de distinguer ces deux espèces de *Polydrusus*.

Keywords. – Pistachio, *Pistacia*, Iran, weevils, pest species.

The genus *Polydrusus* Germar, 1817, comprises over 200 species in the world fauna, 190 of them are Palaearctic (YUNAKOV, 2013), four are Nearctic species, 14 are described from southern North America and from Central America, and three species from Chile (MELESHKO & KOROTYAEV, 2006). ALONSO-ZARAZAGA & LYAL (1999) distinguished 24 subgenera within *Polydrusus*; two subgenera were described subsequently (MELESHKO & KOROTYAEV, 2005), and two others were recently synonymised (YUNAKOV & KLASS, 2012).

The biology of immature *Polydrusus* is poorly known. Adults feed on leaves of trees and shrubs, and larvae feed on roots. Several species are parthenogenetic in their entire ranges or on their largest part, while in smaller part of the ranges they reproduce bisexually (KOROTYAEV & MELESHKO, 1995).

Amongst the Middle Asian species, the bionomics of *Polydrusus obliquatus* Faust, 1884, was described by ARNOLDI *et al.* (1974) based on voluminous published data cited by these authors. In Southern Tajikistan, adults appear in late April - early May, oviposition lasts from mid-May till the end of the adult activity. Eggs are being laid under dry leaves on the soil. A hatch of *P. obliquatus* contains 3 to 55 eggs; up to 300 eggs are laid per a female. The newly emerged larvae deepen into the soil down to 5-15 cm, where they feed on roots of herbaceous plants. Pupal development of *P. obliquatus* starts in mid-April and lasts 10 days.

No data on damaging trees of *Pistacia mutica* Fisch. & C. A. Mey. (Anacardiaceae) in Tajikistan and Georgia by any *Polydrusus* has been reported by NASREDDINOV (1975) and CHOLOKAVA (1996) after prolonged studies of the respective faunas, although several species of *Polydrusus* cause serious damage to the foliage of many arboreal species from families other than Anacardiaceae. In Turkey, LODOS (1972) recorded *P. inustus* (Germar, 1824) as “some-

times injurious to cultivated pistachio”; the same author (LODOS, 1977) recorded *P. roseiceps* Pesarini, 1975, as polyphagous on several trees, including pistachio. LODOS *et al.* (2003) recorded only one specimen of *P. hirsutipennis* Pic, 1908, on *Pistacia*.

In Iran, YUNAKOV (2013) lists 14 *Polydrusus* species, belonging to six subgenera. *Polydrusus nadaii* belongs to the subgenus *Stenodrusus* Meleshko & Korotyaev, 2005. This species was described from Saadat-Shahr in the Fars Province, and has not been recorded afterwards. This is the second record and the first information on the bionomics of *P. nadaii*.



Fig. 1-6. – Adults of *Polydrusus nadaii* Meleshko & Korotyaev and damage on leaves. – 1, Leaves of Pistachio damaged by *P. nadaii*. – 2, Adult of *P. nadaii* on Pistachio leaf. – 3, Lateral view of head. – 4, Dorsal view of head and pronotum. – 5, Dorsal view of elytra. – 6, Hind leg.

MATERIAL AND METHODS

Nearly twenty specimens were collected in traditional pistachio gardens in the vicinity of Ghazvin City, 36°26'N - 49°49'E, 1278 m, where no pesticide treatment is done and the gardens were abandoned. Individuals feeding on the leaves of *Pistacia vera* L. trees were collected. Several specimens were dissected and their internal parts were mounted following microscopy regular procedures. The specimens were compared with a paratype in the Zoological Institute (St. Petersburg).

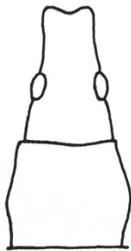
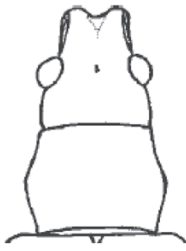
RESULTS AND DISCUSSION

The external characters (the body shape and bicolour pattern of the vestiture) of the specimens collected on Pistachio (fig. 2-6) are similar to those of *P. nadaii*. Internally, the spermatheca and the maxilla are identical. However, the population of the pest species has minor differences from the type-series: the elytra are less strangled at apical third, the hairs on the elytra are subrecumbent instead of recumbent, and the shape of the distal margin of prementum in the labium is slightly different.

Diagnosis. – Body length 5.4-7.0 mm. Body and femora (except apex) dark brown; tibiae rufous with infusate basal part; antennae and tarsi rufous. Median part of dorsum covered with pinkish scales, sides with pale green scales. Elytra with coarse subrecumbent dark setae. Fig. 2-6.

Head narrow; rostrum almost 1.5× as wide as long, with straight sides. Surface of rostrum flat, with dense shallow punctures and weak median carina in anterior half. Eyes medium-sized, moderately convex. Pronotum weakly transverse, weakly rounded, widest slightly before middle, only 1.15× as wide as head (measured across eyes) and much narrower than elytra (0.6× as wide as those). Elytra 2.06-2.11×

Table I. – Differences between the adults of *Polydrusus davatchii* Hoffmann and *P. nadaii* Meleshko & Korotyaev.

	<i>P. davatchii</i>	<i>P. nadaii</i>
Reproduction	Bisexual	? Parthenogenetic (only females known)
Size	5.0-5.5 mm	5.4-7.0 mm
Rostrum	With a furrow, subquadrate	Slightly depressed longitudinally, wider than long
Head	Narrow; frons much narrower than anterior part of pronotum; eyes smaller, weakly convex 	Wide; frons only slightly narrower than anterior part of pronotum; eyes larger, globose 
Dorsal scales	Piliform grey and white	Drop-shaped scales, pinkish in medial part of dorsum, and green or creamy on sides
Dorsal setae	Pinkish	Dark
Pattern on elytra	Usually two oblique bands on elytra	Usually pinkish line along suture, sides of elytra green

as long as wide, narrow, with well-developed humeral prominences, narrowing and compressed at apex. Suture roof-shaped raised. Wings well developed. Legs long, slender. Femora moderately swollen, armed with fine, sharp tooth.

The species is probably parthenogenetic (no males have been found).

Comparative notes. – Another *Polydrusus* species has been largely reported to feed in Pistachio trees in Iran, *Polydrusus davatchii* Hoffmann, 1956 (HOFFMANN, 1956; SADEGHI & ZARE, 2006). The two species can be differentiated following the table I.

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REFERENCES

- ALONSO-ZARAZAGA M. A. & LYAL C. H. C., 1999. – *A world catalogue of families and genera of Curculionoidea (Insecta: Coleoptera) (Excepting Scolytidae and Platypodidae)*. Barcelona, Spain: Entomopraxis, 315 p.
- ARNOLDI L. V., TER-MINASSIAN M. E. & SOLODOVNIKOVA V. S., 1974. – Weevils (p. 218-293). In: Kryzhanovskij O.-L. (ed.), *Nasekomye i kleshchi – vrditeli sel'skokhozyaistvennykh kul'tur* (Insects and mites injurious to agricultural crops). Vol. 2. *Zhestkokrylye* (Coleoptera). Leningrad: Nauka. [In Russian].
- CHOLOKAVA A. O., 1996. – *Weevils (Coleoptera: Atelabidae and Curculionidae) of Georgia*. Referate of the Doctor of Science Thesis. Institute of Zoology, Academy of Sciences, Georgia, Tbilisi, 108 p. [In Georgian and Russian].
- HOFFMANN A., 1956. – Curculionides nouveaux rapportés par la mission G. Remaudière en Iran. *Revue de Pathologie végétale et d'Entomologie agricole*, **35** (4): 241-249.
- KOROTYAEV B. A. & MELESHKO J. E., 1995. – Characteristic features of the distribution of parthenogenetic weevils on example of *Polydrusus inustus* Germ. and *P. pilifer* Hochh. (Coleoptera, Curculionidae). *Fauna and taxonomy: Proceedings of the Zoological Museum of the Byelorussian University*, **1**: 213-227. [In Russian].
- LODOS N., 1972. – Preliminary List of Curculionidae with Notes on Distribution and Biology of Species in Turkey. II. *Polydrusus* Germ. *Yearbook of the Faculty of Agriculture, University of Ege*, **3** (1): 41-67.
- 1977. – Additional notes to the Turkish Curculionidae (Coleoptera) (Brachyderinae). *Türkiye bitki koruma dergisi*, **1** (2): 3-11.
- LODOS N., ÖNDER F., PEHLIVAN E., ATALAY R., ERKIN E., KARSAVURAN Y., TEZCAN S. & AKSOY S., 2003. – *Faunistic studies on Curculionidae (Coleoptera) of Western Black Sea, Central Anatolia and Mediterranean Regions of Turkey*. İzmir: Serdar Tezcan, 83 p.
- MELESHKO J. E. & KOROTYAEV B. A., 2005. – Two New Species of the Weevil Genus *Polydrusus* Germar (Coleoptera: Curculionidae: Entiminae) from Southern Iran (p. 289-297). In: Konstantinov A., Tishechkin A. & Penev L. (eds.), *Contributions to Systematics and Biology of Beetles. Papers Celebrating the 80th Birthday of Igor Konstantinovich Lopatin*. Sofia, Moscow: Pensoft.
- 2006. – On the systematic position of the weevil *Polydrusus americanus* (Gyllenhal, 1834) (Coleoptera, Curculionidae). *Entomologicheskoe Obozrenie*, **85** (4): 871-876. [In Russian].
- NASREDDINOV Kh. A., 1975. – *Weevils (Coleoptera, Curculionidae) of Southern Tajikistan*. Referate of the PhD Thesis. Zoological Institute of the Academy of Sciences of the USSR, Leningrad, 26 p. [In Russian].
- SADEGHI H. & ZARE M., 2006. – The injurious arthropods of wild pistachio trees (*Pistacia vera*: Anacardiaceae) in northeastern Iran. *Caspian Journal of Environmental Sciences*, **4** (1): 83-87.
- YUNAKOV N. N., 2013. – *Polydrusini* (p. 364). In: Löbl I. & Smetana A. (eds), *Catalogue of Palaearctic Coleoptera*, **8**. Leiden: Brill, 700 p.
- YUNAKOV N. N. & KLASS K. D., 2012. – Contribution to the taxonomy and nomenclature of Entiminae from the Palaearctic region and South Africa (Coleoptera: Curculionidae). *Beitrag zur Entomologie*, **62** (2): 427-445.