

***Dasygaster morawitzi* Radchenko, 2016, a newly recorded
solitary bee species in Hungary (Apoidea: Melittidae)**

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Abstract – Until now four species of the genus *Dasygaster* Latreille, 1802 were known from Hungary: *Dasygaster argentata* (Panzer, 1809), *D. braccata* (Eversmann, 1852), *D. hirtipes* (Fabricius, 1793) and *D. suripes* (Christ, 1791). Several *Dasygaster* specimens collected in the National Botanical Garden, Vácrátót and the *Dasygaster* material in the Hymenoptera Collection of the Hungarian Natural History Museum were examined, and *Dasygaster morawitzi* (Radchenko, 2016), a new species for the Hungarian fauna was found. In this paper we report the first Hungarian records of this species. With 14 figures.

Key words – new record, faunistics, Carpathian Basin, oligolectic

INTRODUCTION

The genus *Dasygaster* Latreille, 1802 includes 40 described species worldwide that makes it the largest genus in the Melittidae family (BAKER 2002, MICHENER 1981, MICHEZ *et al.* 2004, RADCHENKO 2016, 2017, RASMONT *et al.* 2017). Four species have been known and listed for the Hungarian fauna so far, namely *Dasygaster argentata* (Panzer, 1809), *D. braccata* (Eversmann, 1852), *D. hirtipes* (Fabricius, 1793) and *D. suripes* (Christ, 1791) (JÓZAN 2011). The *Dasygaster* species are specialised on visiting plants of Asteraceae, Cistaceae and Dipsacaceae families (MICHEZ *et al.* 2008, SHEBL *et al.* 2015). In this paper *Dasygaster morawitzi* (RADCHENKO, 2016) is presented as new for the Hungarian wild bee fauna. The species is widespread in some European countries and was recently recorded in Germany (RADCHENKO 2017, SCHEUCHL & SCHWENNINGER 2017).

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MATERIALS AND METHODS

Several wild bee species of the genus *Dasypoda* were collected by sweep net during direct flower observations from different plants of Asteraceae in the National Botanical Garden, Vácrátót (Hungary) from April to August, 2018. Bees were stored in vials with 70% ethyl-alcohol. Additionally, transect sampling was conducted in open meadow areas of the Botanical Garden during the same period to collect wild bees from several plant species, and random field collection was carried out near Vecsés, Tura and other nearby small villages of Pest county in the third week of July 2018. The collected specimens were identified based on MICHEZ *et al.* (2004), MICHEZ (2012) and on the description of *D. morawitzi* (RADCHENKO 2016). The texture of galea was compared between *D. hirtipes* and *D. morawitzi*. In addition, the male terminalia were dissected and compared of both species with illustration published by RADCHENKO (2016).

The *Dasypoda* material in the Hymenoptera Collection of the Hungarian Natural History Museum (HNHM, Budapest) was checked in late July and beginning of August, 2018. It included hundreds of *D. hirtipes* specimens under various junior synonym names such as *D. plumipes* (Panzer, 1797) or *D. altercator* (Harris, 1780), and as *D. hirtipes* var. *minor* (Morawitz, 1874). The material was checked and re-identified based on the shape of the galea. Thirty specimens were identified as *D. morawitzi* based mainly on the the galea texture. The genital capsule and sternites of two males were dissected. The material was checked by using stereoscopic microscope OLYMPUS SZX9. Photos were taken by a Samsung mobile lens and the plates were prepared using free editing software “PHOTOSCAPE”.

RESULTS AND DISCUSSION

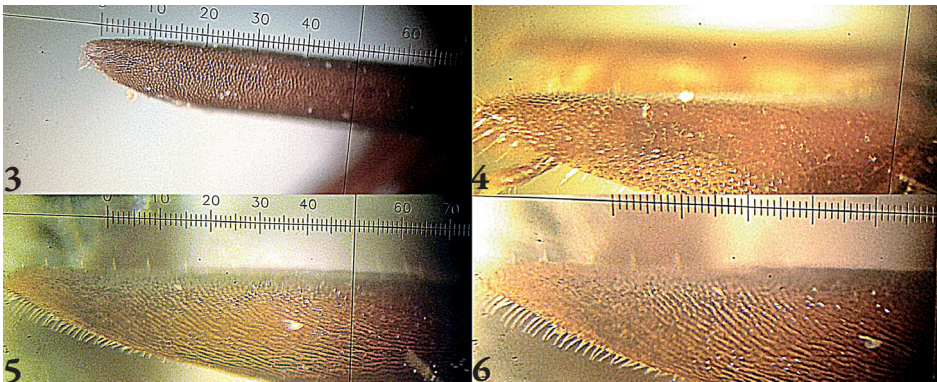
Dasypoda hirtipes (Fabricius, 1793)
(Figs 1–4)

Material examined – Hungary, Pest county: Tura (47.5720611° N, 19.6541167° E), 21.VII.2018, leg. M. Shebl, 3♀♂. Vácrátót, Botanical Garden (47.70° N, 19.23° E), 31.V.2018, leg. M. Shebl, 1♂; same locality, 20.VI.2018, leg. M. Shebl, 2♀♂; same locality, 25.VI.2018, leg. M. Shebl, 7♀♂; same locality, 27.VI.2018, leg. M. Shebl, 1♀1♂. Vecsés (47.4141833° N, 19.3072278° E), 23.VII.2018, leg. M. Shebl, 4♀1♂. – The *D. hirtipes* material examined and re-identified in the HNHM is numerous and the label data are not listed here.

Floral resources – *Knautia arvensis* (Dipsacaceae), *Taraxacum officinale*, *Cichorium intybus*, *Coreopsis lanceolata* (Asteraceae) and *Geranium orion* (Geraniaceae).



Figs 1–2. *D. hirtipes* (Fabricius, 1793) foraging on Asteraceae: 1 = female, 2 = male



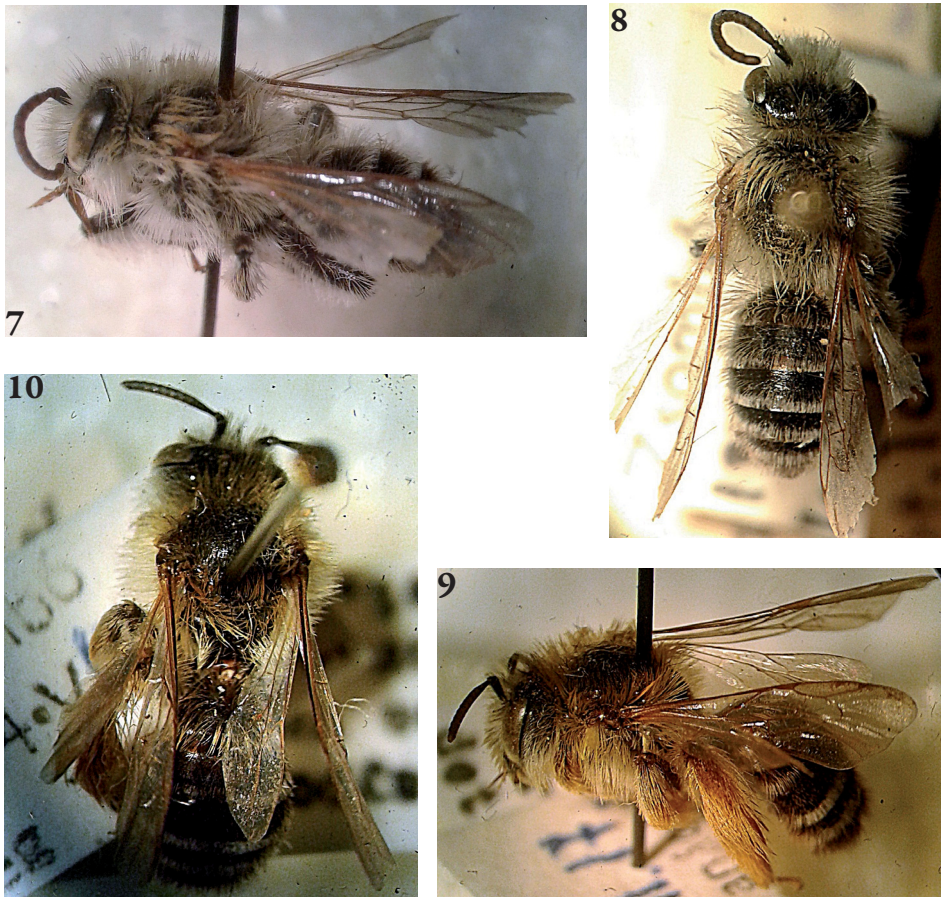
Figs 3–6. Galea textures: 3–4 = *D. hirtipes*, 5–6 = *D. morawitzi*

Dasygoda morawitzi Radchenko, 2016
(Figs 5–14)

Material examined – Hungary, Budapest, date unknown, leg. Bartkó, 1♂; Budapest, 27.VIII.1957, leg. M. Móczár, 2♂. – Hungary, Bács-Kiskun county: Apostag, 8.VIII.1957, leg. M. Móczár, on *Solidago*, 1♂; Ágasegyháza, 28.VII.1953, leg. M. Móczár, 3♀; same locality, 28–30.VII.1955, leg. M. Móczár, 1♀; same locality, 14.VIII.1957, leg. M. Móczár, 1♂1♀; Fülöpháza, védett buckás [= protected sand dunes], 5.IX.1978, leg. J. Papp, 1♂; Kecskemét, 18.VII.1962, leg. Sólymosné, 2♂; Kerekegyháza, Konda-tó [= lake], 25.VII.1957, leg. J. Papp, 1♂; Kiskunfélegyháza [on label: Félegyháza], date unknown, leg. M. Móczár, 2♀. – Hungary, Csongrád county: Petőfiszállás, Péteri-tó [= lake], 11.XI.1980, leg. J. Papp, 1♀; Zsombó, 5.VII.1973, leg. L. Tanács, 1♂; same locality, 17.VII.1973, leg. L. Tanács, 1♂; same locality, 23.VII.1973, leg. L. Tanács, 1♀. – Hungary,

Komárom-Esztergom county: Tata, Tóváros, date unknown, leg. Bartkó, 1♂. – Hungary, Pest county: Diósd, 12–13.VIII.1957, leg. E. Bajári, 1♂; Gödöllő, 14.VII.1997, leg. L. Szalay, 1♀; Ócsa, turján [= palustrine wetland], 3.VIII.1953, leg. E. Bajári, 1♀1♂; same locality, 25.VIII.1952, leg. E. Bajári, 2♀; Solymár, 25.VII.1957, leg. Kakassné, 1♂; Szentendrei-sziget [= island], 14.VIII.1936, leg. M. Móczár, 1♂; Szigetbecse, 14.VII.1988, leg. O. Merkl, 1♂; Vácrátót, Botanical Garden (47.70° N, 19.23° E), 20.VI.2018, leg. M. Shebl, 1♀, 1♂. –Hungary, Zala county: Keszthely, Diás-sziget [= island], 31.VIII.1950, leg. E. Bajári, 1♂.

Floral resources – *Taraxacum officinale*, *Cichorium* sp., *Crepis rhombifolia* and *Solidago* sp. (Asteraceae).



Figs 7–10. General habitus of *D. morawitzi*: 7 = male, lateral view, 8 = male, dorsal view, 9 = female, lateral view, 10 = female, dorsal view

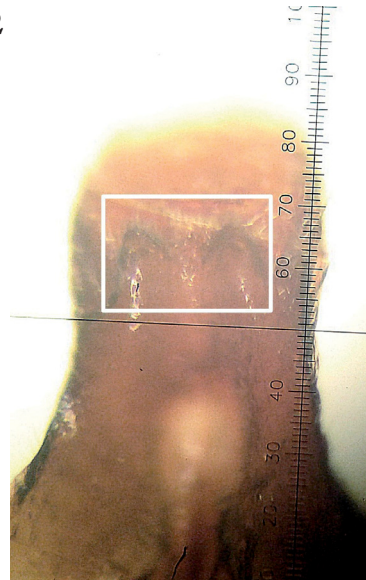
Taxonomic notes on *Dasygoda hirtipes* and *D. morawitzi*

D. hirtipes (Figs 1–2) is larger than *D. morawitzi* (Figs 7–10). The two species are very hard to tell apart based on the floral resources or by the naked eye during field work. The main taxonomic feature to distinguish the two species is the galeal surface texture. In *D. hirtipes* the surface is covered by tubercles (Figs 3–4), while in *D. morawitzi* it looks waved (Figs 5–6). *D. morawitzi* is clearly a medium-

11



12



13



14



Figs 11–14. Genital sternites of male *D. morawitzi*: 11 = dorsal view of sternum 8, 12 = ventral view of sternum 8, 13 = dorsal view of sternum 7, 14 = dorsal view of genital capsule

or small-sized bee in the case of both sexes. Variation in colour is recognised in the case of several individuals of both species (yellowish and whitish forms) (Figs 7–10). Another important feature to distinguish the two species is the structure of the male genital sternites. The shape of sternum 7 of *D. morawitzi* shows rounded and broad apical projections (Fig. 13) (not broad and less rounded in *D. hirtipes*); the apical part of sternum 8 in *D. morawitzi* is wide and rounded with two small and short teeth (Figs 11–12) (not rounded with two short and close teeth in *D. hirtipes*). The shape of the male genital capsule is shown in Fig. 14.

Despite extensive studies on the European wild bee fauna there is still more to be discovered in the Palaearctic region. The identification of species of the genus *Dasypoda* is still problematic at species level (RADCHENKO & PESENKO 1989). Using extensive morphological data combined with the new trend of molecular taxonomy and phylogenetics, faunistical research could lead to further new records of bees (DANFORTH *et al.* 2006, ENGEL 2010, MICHEZ *et al.* 2009). The case of the two species of *D. hirtipes* and *D. morawitzi* would require further clarifications with several *Dasypoda* collections to add more information about the distribution of both species in Europe (RADCHENKO 2016). Hence, it is recommended to check carefully all the collected *Dasypoda* material including old and new ones which can lead to new bee taxa descriptions.

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REFERENCES

- BAKER D. B. 2002: A provisional annotated list of the nominal taxa assigned to the genus *Dasypoda* Latreille, 1802, with the description of an additional species (Hymenoptera, Apoidea, Melittidae). – *Deutsche entomologische Zeitschrift* **49**: 89–103.
<https://doi.org/10.1002/mmnd.20020490107>
- DANFORTH B. N., SIPES S., FANG J. & BRADY S. G. 2006: The history of early bee diversification based on five genes plus morphology. – *Proceedings of the National Academy of Sciences of the United States of America* **103**(41): 15118–15123. <https://doi.org/10.1073/pnas.0604033103>
- ENGEL M. S. 2011: Systematic melittology: where from here? – *Systematic Entomology* **36**: 2–15. <https://doi.org/10.1111/j.1365-3113.2010.00544.x>
- JÓZÁN ZS. 2011: Checklist of Hungarian Sphecidae and Apidae species (Hymenoptera, Sphecidae and Apidae). – *Natura Somogyiensis* **19**: 177–200.
- MICHENER C. D. 1981: Classification of the bee family Melittidae with a review of species of Meganomiinae. – *Contribution of the American Entomological Institute* **18**: 1–135.

- MICHEZ D. 2012: *Atlas of the European Bees: genus Dasygaster*. STEP Project, Atlas Hymenoptera, Mons, Gembloux. <http://www.zoologie.umh.ac.be//hymenoptera/page.asp?ID=195> [Accessed 22 August 2018.]
- MICHEZ D., PATINY S. & DANFORTH, B. N. 2009: Phylogeny of the bee family Melittidae (Hymenoptera: Anthophila) based on combined molecular and morphological data. – *Systematic Entomology* **34**: 574–597. <https://doi.org/10.1111/j.1365-3113.2009.00479.x>
- MICHEZ D., PATINY S., RASMONT P., TIMMERMANN K. & VEREECKEN N. 2008: Phylogeny and host-plant evolution in Melittidae s. l. (Hymenoptera: Apoidea). – *Apidologie* **39**(1): 146–162. <https://doi.org/10.1051/apido:2007048>
- MICHEZ D., TERZO M. & RASMONT P. 2004: Phylogénie, biogéographie et choix floraux des abeilles oligolectiques du genre *Dasygaster* Latreille 1802 (Hymenoptera: Apoidea: Melittidae). – *Annales de la Société Entomologique de France* **40**(3–4): 421–435. <https://doi.org/10.1080/00379271.2004.10697431>
- RADCHENKO V. G. 2016: A new widespread European bee species of the genus *Dasygaster* Latreille (Hymenoptera, Apoidea). – *Zootaxa* **4184**: 491–504. <https://doi.org/10.11646/zootaxa.4184.3.4>
- RADCHENKO V. G. 2017: A new bee species of the genus *Dasygaster* Latreille (Hymenoptera, Apoidea) from Portugal with comparative remarks on the subgenus *Heterodasygaster* Michez. – *Zootaxa* **4350**(1): 164–176. <https://doi.org/10.11646/zootaxa.4350.1.10>
- RADCHENKO V. G. & PESENKO Y. A. 1989: A key to the bees of the genus *Dasygaster* Latreille (Hymenoptera, Melittidae) of the European part of the USSR, with a designation of lectotypes. – *Trudy Zoologicheskogo Instituta Akademii Nauk* **188**: 114–121. [In Russian.]
- RASMONT P., DEVALEZ J., PAULY A., MICHEZ D. & RADCHENKO V. G. 2017: Addition to the checklist of IUCN European wild bees (Hymenoptera: Apoidea). – *Annales de la Société entomologique de France* **53**(1): 17–32. <https://doi.org/10.1080/00379271.2017.1307696>
- SCHEUCHL E. & SCHWENNINGER H. R. 2017: Checkliste der Wildbienen Deutschlands (Scheuchl & Schwenninger 2015), Aktualisierung Februar 2017. – In: *Wildbienen-Cataster*. <https://www.wildbienen-kataster.de/login/downloads/checkliste.pdf> [Accessed 22 August 2018.]
- SHEBL M. A., PATINY S. & MICHEZ D. 2015: Supplementary note on the solitary bee fauna of the Suez Canal region of Egypt (Hymenoptera: Apoidea). – *Journal of Melittology* **47**: 1–5. <https://doi.org/10.17161/jom.v0i47.4835>