

Review of Corsican *Diodontus* Curtis, 1834, with description of two new species (Hymenoptera, Apoidea, Pemphredonidae)

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<https://zoobank.org/References/7D7A01CD-4D62-4818-B2BF-AE665EB7E698>

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Abstract. – The study of 208 Corsican specimens of *Diodontus* reveals that four species occur in Corsica. *Diodontus insidiosus* Spooner, 1938, is newly recorded for this island and two species are new for science: *D. inalpellatus* n. sp. and *D. touroulti* n. sp. The two new species are well supported by their distinct morphology and genetic distance. Finally, *D. friesei* Kohl, 1901, is considered to be absent in Corsica and in France.

Résumé. – Révision des *Diodontus* Curtis, 1834, de Corse, avec la description de deux nouvelles espèces (Hymenoptera, Apoidea, Pemphredonidae). L'examen de 208 individus corses de *Diodontus* indique que quatre espèces se trouvent en Corse. *Diodontus insidiosus* Spooner, 1938, est nouvellement signalé pour l'île et deux espèces sont nouvelles pour la science : *D. inalpellatus* n. sp. et *D. touroulti* n. sp. Les deux espèces nouvelles sont bien supportées par leur morphologie distincte et leur distance génétique. Enfin, *D. friesei* Kohl, 1901, est considéré comme absent en Corse et en France.

Keywords. – Sphecoid wasps, Pemphredonini, aphid predator, taxonomy, morphology, barcoding, France.

The genus *Diodontus* Curtis, 1834, includes 78 species worldwide (PULAWSKI, 2023), of which 17 occurs in Europe and seven in France (BITSCH *et al.*, 2022). They are small aphid hunting wasps. Their taxonomy and distribution are still poorly known and cryptic species are known to occur in Europe (LECLERCQ, 1974; OLSZEWSKI *et al.*, 2016; BUDRYS *et al.*, 2019). Three species have been recorded so far in Corsica, *Diodontus minutus* (Fabricius, 1793) by FERTON (1905), *D. tristis* (Vander Linden, 1829) by FERTON (1908) and *Diodontus friesei* Kohl, 1901 by PAGLIANO (2009) (as *D. hyalipennis* in BITSCH *et al.*, 2022). Recent investigations in Corsica (LPR 2019-2021) and examination of the collection of Charles Ferton (MNHN) made possible a modern review of the Corsican fauna which is quite different than what was previously known.

MATERIAL AND METHODS

Despite being abundant, *Diodontus* specimens are rarely collected comparatively to many other Apoidea due to their small size and discrete behaviour. They can be observed on the leaves of plants, resting on rocks, or flying over bare ground. The best methods to collect them is to use white and yellow pan traps, Malaise traps, artificial honeydew or to look for plants attacked by aphids and covered by aphid honeydew. Using these methods, many individuals were collected in all Corsica between 2017 and 2021. Including the material found in the collection of the Muséum national d'Histoire naturelle and of the University of Mons, a total of 208 individuals were examined. In the examined material section, the municipality (in bold) is mentioned for the first data only and is similar for all following records. Records are sorted out by locality and by dates (from the oldest to the most recent).

Abbreviations. – Depositories and expedition mentioned in the examined material are as follows.

– LPR 2019-2021: *La Planète Revisitée (Our Planet Revisited) en Corse 2019-2021* is an expedition organized by the MNHN in Corsica during three consecutive years (TOUROULT *et al.*, 2023). Material was mainly collected by the author and will be shared between MNHN, the author's collection and the OCIC. Holotypes of the new species will be deposited in MNHN.

– MNHN: Muséum national d'Histoire naturelle (Paris, France); historical material (1895-1910) collected by Charles Ferton, modern material (2016-2017) collected by A. Cornuel-Willermoz in the framework of the research project of the MNHN initiated by C. Villemant, C. Fontaine and A. Perrard.

– OCIC: Observatoire Conservatoire des Insectes de Corse (Corte, Corsica); material collected by A. Cornuel-Willermoz.

– UMONS: Laboratory of Zoology of the university of Mons (Belgium); material collected by M. Wonville.

Barcoding. – A barcoding program was initiated within the framework of these LPR expeditions. The sex association and the molecular divergence of the two new species were confirmed with CO1 sequences using the BOLD workbench (<https://www.boldsystems.org/>). The dataset DS-KDIOD is available on BOLD and includes eight barcoded specimens of the two new species. The BOLD process ID mentioned in this catalogue can be found in this dataset. Mean p-distance were calculated with the “distance summary” tool of the BOLD workbench (settings: Sequences \geq 500db, Kimura 2-parameter, MUSCLE aligner).

Terminology. – Morphological terminology follows that of BOHART & MENKE (1976) except for the term “orbital gland” which is used instead of “orbital fovea” (see BUDRYS *et al.*, 2019). As the morphology of the sphecid wasps is very variable, it is important to precise that the term “upper mesepisternum” designates the area between the scrobal sulcus and the hypersternaulus while the term “lower mesepisternum” designates the area between the hypersternaulus and the signum. Details about the morphological abbreviations and measurements can be found in BUDRYS (1996). The following abbreviations are also used: ASD, antennal socket diameter; PD, puncture diameter; F, flagellomere, numbered from the base of flagellum (excluding the pedicel); T, tergite, numbered from the base of metasoma; S, sternite, numbered from the base of metasoma.

Measures and imaging. – Morphological measurements and pictures were done using a Keyence VHX-970F digital microscope. Final illustrations were postprocessed for sharpness, contrast, and brightness, using Adobe Photoshop CS6. Line drawings of the penial valves were done with Adobe Photoshop CS6 using an Leitz HM-LUX 3 microscope (magnification \times 400).

RESULTS

Diodontus inalpellatus n. sp. (fig. 1a-d, 2a-c, 3a-d, 4a-b)

<https://zoobank.org/NomenclaturalActs/882bedb4-9c27-44da-ac0a-30ab103dd734>

HOLOTYPE : ♂, **Quenza**, 41.83295°N 9.15318°E, 26.VI.2019-30.VI.2019 (LPR 2019-2021).

PARATYPES: 2 ♂, **Asco**, 42.40211°N 8.92198°E, 22.VI.2020 (LPR 2019-2021); 1 ♀, 1 ♂, 42.39279°N 8.91104°E, 22.VI.2020 (LPR 2019-2021); 1 ♂, **Bastelica**, 42.03711°N 9.13842°E, 29.VI.2020 (LPR 2019-2021); 2 ♀, 2 ♂ **Bocognano**, 42.10497°N 9.11953°E, 28.VI.2020 (LPR 2019-2021); 3 ♀, 2 ♂, 42.10573°N 9.11664°E, 28.VI.2020 (LPR 2019-2021); 2 ♀, 1 ♂, 42.10878°N 9.11467°E, 28.VI.2020 (LPR 2019-2021); 2 ♂, **Ghisoni**, 42.03204°N 9.15855°E, 29.VI.2020 (LPR 2019-2021); 1 ♂, 42.02924°N 9.1626°E, 29.VI.2020 (LPR 2019-2021); 1 ♀, **Quenza**, 41.83306°N 9.15871°E, 26.VI.2019-30.VI.2019 (LPR 2019-2021); 2 ♀, 41.83273°N 9.15901°E, 26.VI.2019-30.VI.2019 (LPR 2019-2021); 1 ♀, 1 ♂, 41.83295°N 9.15318°E, 26.VI.2019-30.VI.2019 (LPR 2019-2021); 1 ♀, 41.83265°N 9.15684°E, 26.VI.2019-30.VI.2019 (LPR 2019-2021); 1 ♂, 41.83328°N 9.15721°E, 26.VI.2019-30.VI.2019 (LPR 2019-2021); 1 ♀, 8 ♂, 41.83265°N 9.15684°E, 26.VI.2019 (LPR 2019-2021); 1 ♀, 41.82853°N

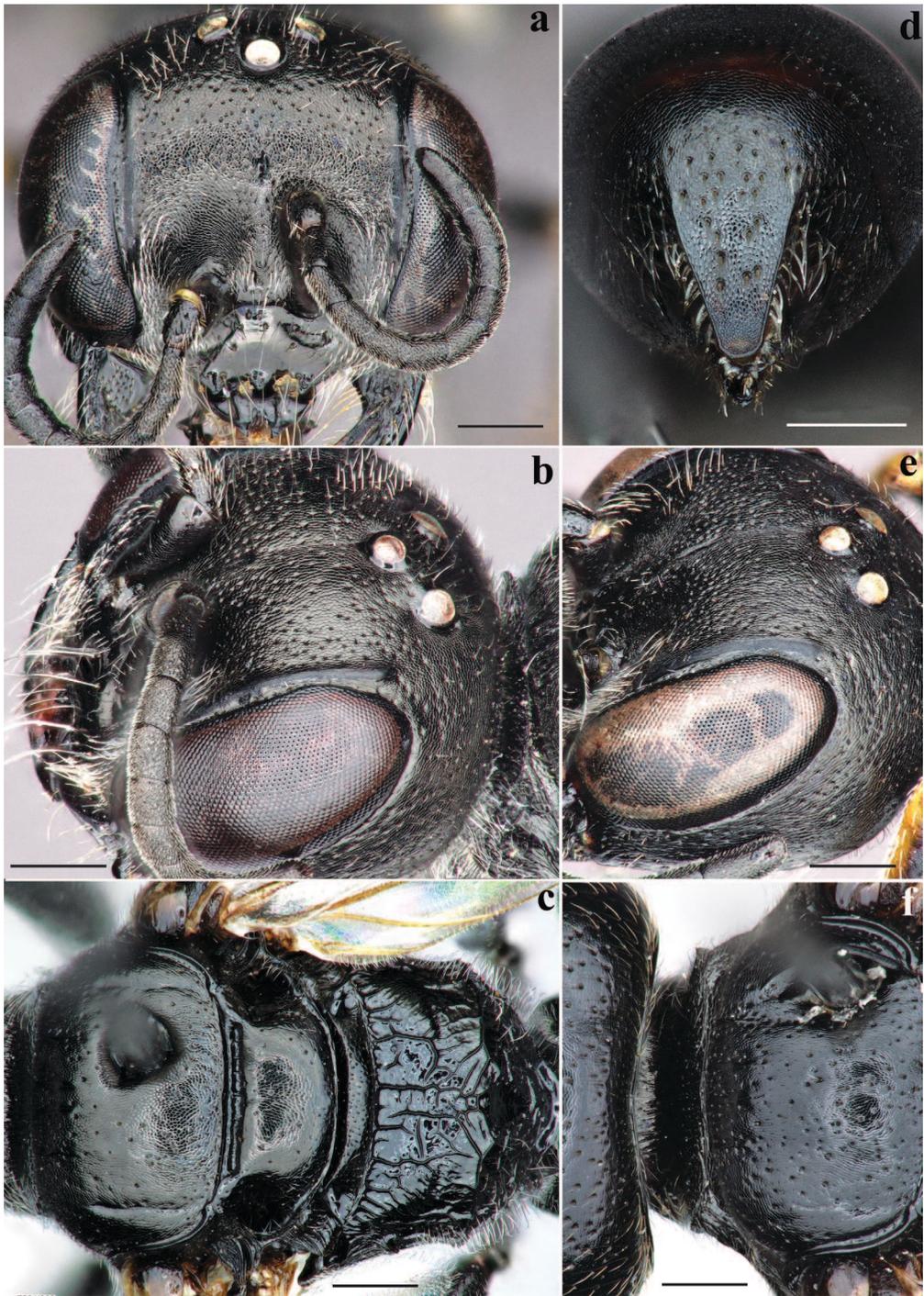


Fig. 1. – *Diodontus* spp. – a-d, *D. inalpellatus* n. sp., ♀: a, face; b, face in lateral view; c, mesosoma in dorsal view; d, Pygidial plate. – e, *D. wahisi* Leclercq, ♀, face in lateral view (French Alps). – f, *D. luperus* Shuckard, ♀, pronotal collar (France). Scale bars: 0.25 mm.

9.14761°E, 26.VI.2019 (LPR 2019-2021); 2 ♂, 41.83273°N 9.15901°E, 30.VI.2019 (LPR 2019-2021); 3 ♂, 41.83049°N 9.15°E, 30.VI.2019 (LPR 2019-2021); 1 ♂, 41.83295°N 9.15318°E, 30.VI.2019 (LPR 2019-2021); 2 ♂, **Serra-di-Scopamène**, 41.83455°N 9.15654°E, 26.VI.2019 (LPR 2019-2021); 2 ♂, 41.83369°N 9.15723°E, 30.VI.2019 (LPR 2019-2021); 2 ♂, **Vivario**, 42.10646°N 9.12214°E, 28.VI.2020 (LPR 2019-2021).

Additional material. – 1 ♀, 2 ♂, **Quenza**, Bucchinera, 1480 m, 8-10.VII.1993 (UMONS); 1 ♀, **Vivario**, Vizzavona, 1200 m, 16.VII.1899 (MNHN); 1 ♀, 17.VII.1899 (MNHN).

Diagnosis. – This species is closely related to *Diodontus luperus* Shuckard, 1837, and *Diodontus wahisi* Leclercq, 1964. It keys out in BITSCH *et al.* (2022) as *D. wahisi*, a species restricted to high elevations in the Pyrenees and the Alps. The female of *D. inalpellatus* is very difficult to distinguish from that of *D. wahisi*, but the male is very distinct, much closer to that of *D. luperus*. Morphological differences found between all these species are very small and difficult to apprehend without series.

The female differs from that of *D. wahisi* by the remarkably convex orbital gland (fig. 1b) (flattened in *D. wahisi*; see fig. 1e), a somewhat narrower longitudinal furrow on the orbital gland (large and conspicuous in *D. wahisi*) and a comparatively denser and deeper punctation on metasomal sternites. The male can easily be distinguished from that of *D. wahisi* by the lack of tooth on F7-8 (fig. 3b) (F(7-)8 with a sharp tooth in *D. wahisi*; see fig. 3e) and the conspicuous punctation of the frons (fig. 3c) (in *D. wahisi* the punctation of the frons is indistinct, scarce, shallow, and merged in the shagreen; see fig. 3f). Both male and female of *D. inalpellatus* can be distinguished from that of *D. luperus* by the ivory white pronotal lobes (fig. 2b, 3d) (always black in *D. luperus*; see fig. 2e); the entirely tightly tessellate gaster (fig. 2c, 4a) (in *D. luperus*, the apical margin of T1-2 is smooth and shiny if not all apical margins, the rest of T1 is either smooth and shiny or with inconspicuous shagreen, the rest of T2 is lightly tessellate; see fig. 2f, 4c); the small dorsolateral angles of the pronotal collar (fig. 1c, 2a) (protruding and sharply carinate in *D. luperus*; see fig. 1f, 2d); preomaulal area hardly separated from the mesepisternum by an omaulus reduced to a shallow ridge (fig. 2b, 3d) (omaulus raised in a sharp conspicuous carina in *D. luperus*; see fig. 2e); prepectus, episternal sulcus, scrobal sulcus and mesepisternum indistinctly merged altogether into a finely reticulate surface with many small alveoli (fig. 2b, 3d) (in *D. luperus* the scrobal sulcus and prepectus are distinct, comparatively more depressed with large shiny pits, the mesepisternum is coarsely reticulate by a few sharply raised carina delimiting large alveoli; see fig. 2e); hypoepimeral lower margin at most finely ridged anteriorly (fig. 2b, 3d) (hypoepimeral area separated from the scrobal sulcus by a sharp carina in *D. luperus*; see fig. 2e); hypersternaulus comparatively less impressed than in *D. luperus*; upper metapleural area matte, densely longitudinally ridged, ridges separated at most by the width of one ridge (fig. 2b) (shiny with 3-4 sharply raised carinas separated by large smooth interspaces in *D. luperus*; see fig. 2e).

The male of *D. inalpellatus* can also be distinguished from that of *D. luperus* by the indentation of the penial valve tip outline, its inferior and apical margin being lightly indented with small irregular and scarce blunt teeth (fig. 4b) (saw edged outline in *D. luperus*, with many regular and sharply produced teeth; see fig. 4d). Finally, the inferior membrane is reduced in *D. inalpellatus*, hardly separated from the sclerotized part of the penis (developed and conspicuous in *D. luperus*).

Female description. – Body length 4.5-5.5 mm. Body black; pronotal lobes and spot on tegulae yellow; protibiae with yellow stripe anteriorly, base of mesotibiae and metatibiae with yellow ring; tip of mandibles dark red to nearly black; tibiae posteriorly and mesally brown to nearly black; tarsi ferruginous to dark brown; pterostigma nearly black with a lighter strip along the edge of wing; apical margin of tergites horn-coloured.

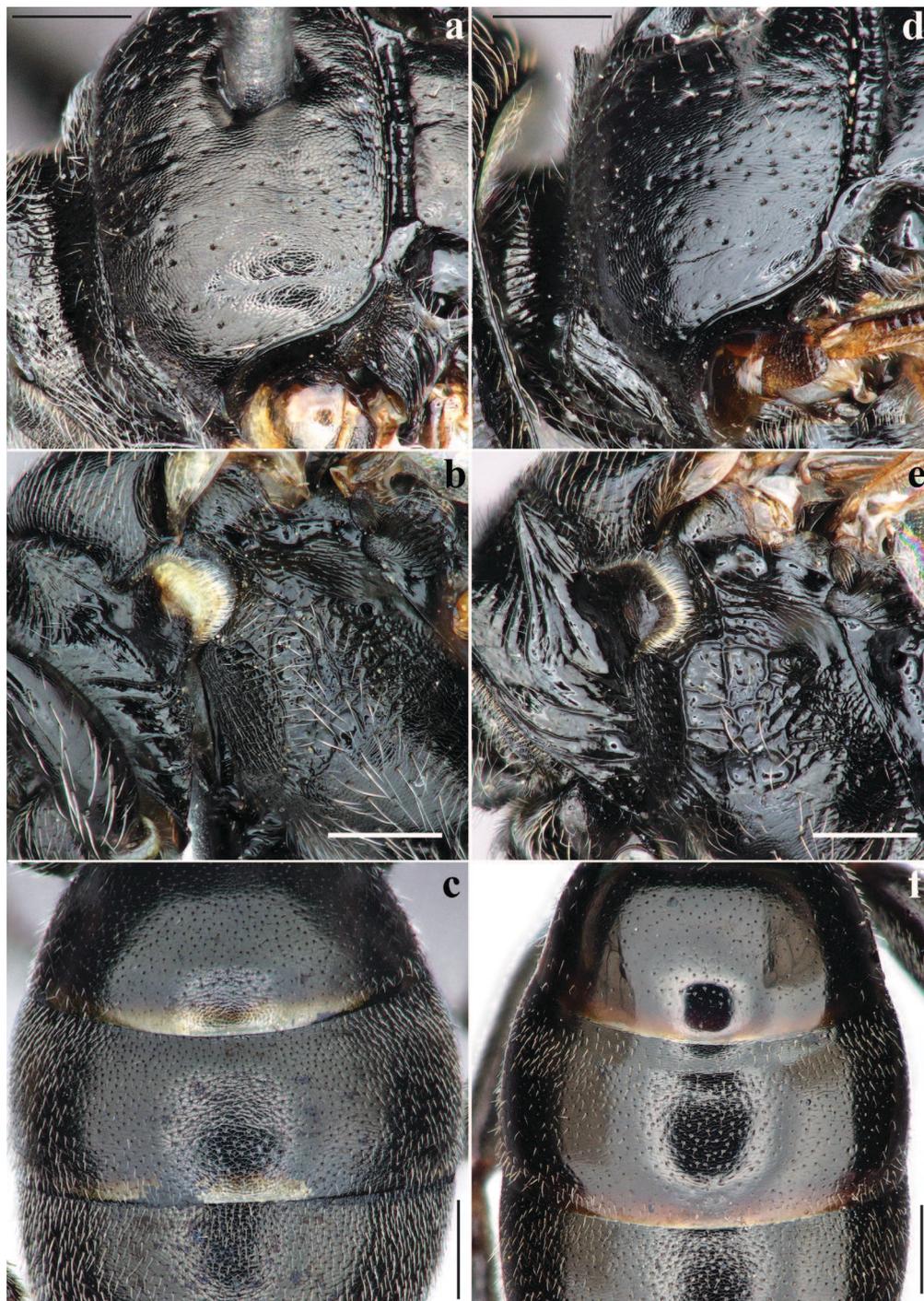


Fig. 2. – *Diodontus* spp. – **a-c**, *D. inalpellatus* n. sp., ♀: **a**, pronotal collar in lateral view; **b**, mesopleuron; **c**, T1-3. – **d-f**, *D. luperus* Shuckard, ♀ (France): **d**, pronotal collar in lateral view; **e**, mesopleuron; **f**, T1-3. Scale bars: 0.25 mm.

Head transverse (fig. 1a), WH:LF = 1.48-1.50. Face wide, LID:LF = 0.76-0.79. Inner orbits weakly converging apically, LID:UID = 0.85-0.91. Vertex developed, LV:LF = 0.46-0.47, LV:POD = 2.30-2.45. Ocelli forming obtuse triangle, POD:OOD = 0.70-0.77. Genae wider than the eyes, around 1.2 times as wide as the eyes in lateral view. Occiput carinate. Mandibular condyles widely separated, IMD:WH = 0.70-0.72. Clypeus relatively long, LCL:LF = 0.26-0.27. Clypeus free margin tridentate, relatively narrow, WCA:IMD = 0.26-0.29; mid-tooth as long as lateral teeth. Labrum hemispherical, with small apical notch. Scape moderately long, LSC:LF = 0.37-0.46. Flagellum comparatively short, 3FL:LSC = 0.90-0.93. Flagellomeres distinctly longer than wide, around 1.2-1.5 as long as wide (except F11, two times as long as wide). Lower frons with large impunctate shagreened supra-antennal areas, around 2.5 times as long as wide as ASD. Lower frons, between supra-antennal areas, flat, scarcely punctate with inconspicuous tuber. Upper frons tessellate, matte, with fine subcontiguous punctation above supra-antennal areas. Frontal line in front of fore ocellus not impressed. Dorsal part of orbital gland conspicuously convex, prominence as wide as 0.5 WPO (fig. 1b); mid-part wider than distance between it and inner orbit. Pilosity of upper frons short and sparse, around 0.5 WPO. Pilosity of lower frons longer, shorter than 1 WPO, decumbent, not concealing an underlying microsculpture. Clypeus smooth and shiny, with a few punctures and sparse long setae conspicuously longer than 1WPO. Ventral face of genae with long erect setae, the longest longer than 1 WPO.

Mesosoma. Pronotal collar of moderate width, COL:PRN = 0.55-0.57, with carinate dorsolateral angles and almost straight dorsal carina (frontal view). Lateral surface of pronotal collar shiny with sharp carinas. Scutum tessellate with irregularly scattered deep punctation (fig. 1c). Scutellum tessellate with a few punctures, the deep anterior furrow not crenulate. Metanotum very finely and scarcely punctate. Propodeal dorsum with reticulate propodeal enclosure, separated from the propodeum lateral and posterior faces by a thin carina (fig. 1c). Propodeum lateral face shiny with some oblique carinas and not separated from the posterior area by a carina. Propodeum posterior face finely ridged with several transverse carina and a deep median pit. Omaulus reduced to a fine ridge (fig. 2b). Hypoepimeral area lightly lineolate, silky shiny, its lower margin without carina. Scrobal sulcus shallow, merged in the upper mesepisternum. Prepectus and the upper mesepisternum irregularly reticulate with fine shallow carinas delimiting small alveoli. Lower mesepisternum and mesosternum tessellate with a few scarce and deep punctures. Mesosternum covered by semi-decumbent setae measuring around 1 WPO), mesepisternum and mesonotum covered by short erect pubescence (hardly as long as 0.25 WPO). Upper metapleural area matte, densely longitudinally ridged, ridges hardly separated by more than one ridge width, lower metapleural area smooth and shiny. Probasitarsal rakes with erect bristles around as long as probasitarsi width. Protarsi segments with one apical spine on outer margin, nearly as long as associated segment width.

Metasoma. Gastral tergites entirely tessellate, scarcely and minutely punctate (fig. 2c). Apical half of T2-T4 remarkably more sparsely punctate than on their basal half. Pygidial plate subtriangular with a narrow subtruncate tip, tegument with few scarce coarse punctures, matte, tightly tessellate (fig. 1d).

Male description. – Body length 3.5-4.75 mm. Coloration similar to that of female with more extended yellow markings on tibiae and basitarsi yellow to entirely black.

Head. Proportions similar to those of female: WH:LF = 1.43-1.51, LID:LF = 0.79-0.84, LID:UID = 0.90-0.91, LV:LF = 0.39-0.42, vertex shorter, LV:POD = 1.87-1.91, POD:OOD = 0.71-0.81, IMD:WH = 0.61-0.64, LCL:LF = 0.29-0.30. Genae around as wide as the eyes in lateral view. Occiput carinate. Clypeus free margin bidentate with narrow and deep median notch. Labrum subtrapezoidal, apical margin widely emarginate. Scape moderately long, LSC:LF = 0.34-0.35. Flagellum longer (fig. 3b), 3FL:LSC = 1.29-1.33; F1 hardly shorter than F2 (around 0.90-0.98 times as long as F2), median flagellomeres slightly longer than wide (1.1-1.3 as long as wide), L6F:W6F = 1.05-1.15, F11 around 2.2 times as long as wide; F5-8 with black ovoid placoid almost as long as the segments, F9-10 with dark concave ovoid placoid almost as long as the segments, base of F11 with a dark concave placoid measuring $\frac{1}{3}$ of F11 length.

Mesosoma. Pronotal collar of moderate width, COL:PRN = 0.52-0.61, with carinate dorsolateral angles and almost straight dorsal carina (frontal view). Microsculpture and pilosity similar to those

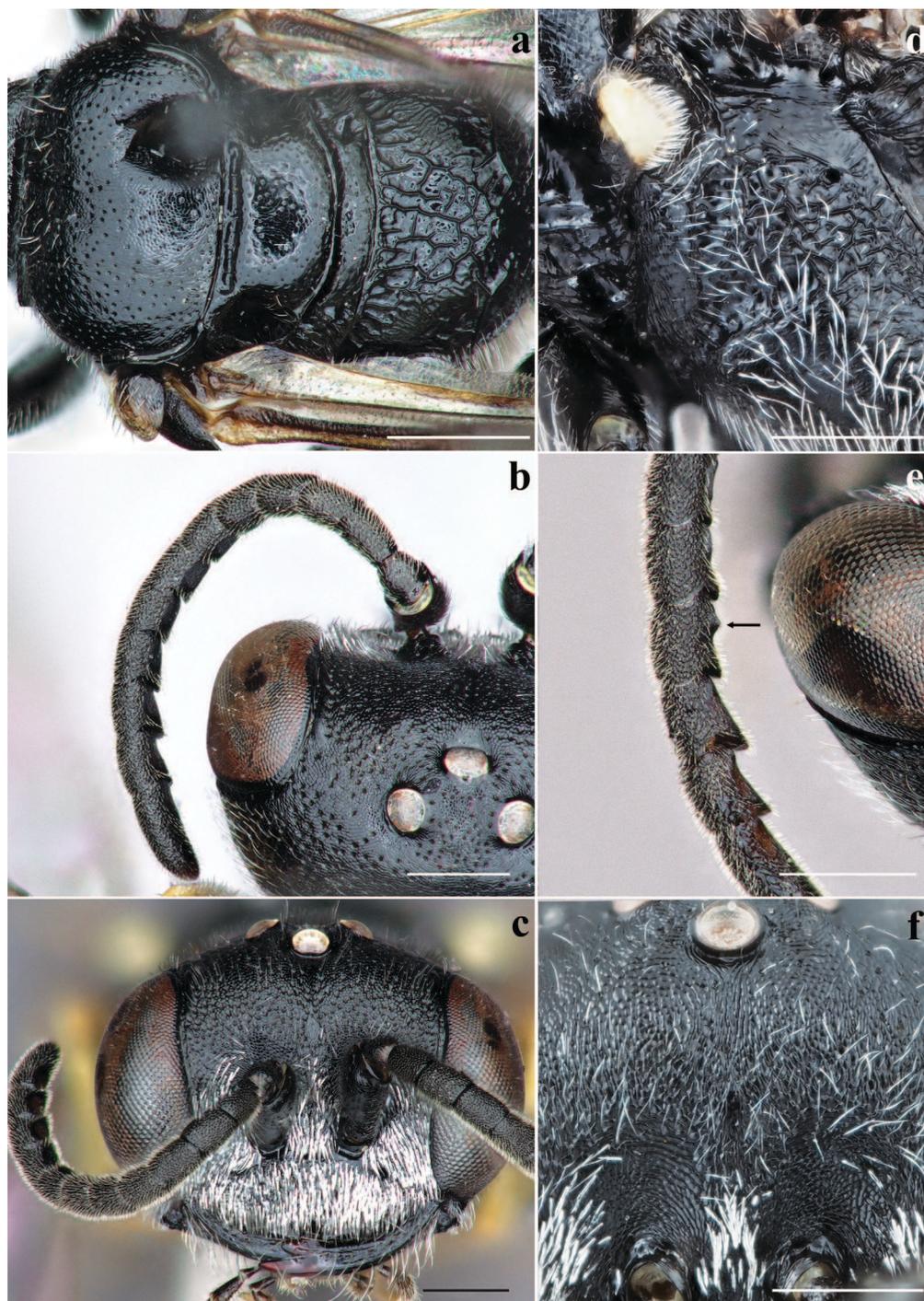


Fig. 3. – *Diodontus* spp. – a-d) *D. inalpellatus* n. sp., ♂: a, mesosoma in dorsal view; b, left antenna; c, face; d, mesopleuron. – e-f, *D. wahisi* Leclercq, ♂ (French Alps): e, left antenna (arrow showing the tooth on F8); f, frons. Scale bars: 0.25 mm.

of female, with following exceptions: upper frons with deeper microsculpture and distinct punctation (fig. 3c); pilosity of lower frons and clypeus dense and silver, concealing the underlying tegument. Sculpture and pilosity of mesosoma similar to those of female, with following exceptions: punctation of mesonotum somewhat denser (fig. 3a), pilosity of mesepisternum as long as that of mesosternum, pilosity of scutum longer (around $\frac{1}{3}$ of WPO) and dense. Legs unmodified, basitarsi straight and narrow.

Metasoma. Gaster tessellate, segments covered by a fine punctation becoming progressively sparser backwardly (fig. 4a). T6 with a pair of apical tubers bearing 2-3 small brown spines; T7 with subtrapezoidal punctate pygidial plate, delimited by distinct carina, around as long as wide. Disc of S2 covered by a dense and long pilosity (longest setae almost as long as hind basitarsi width) and progressively depressed toward its base; disc of S3-S6 almost glabrous and convex. S8 with a triangular

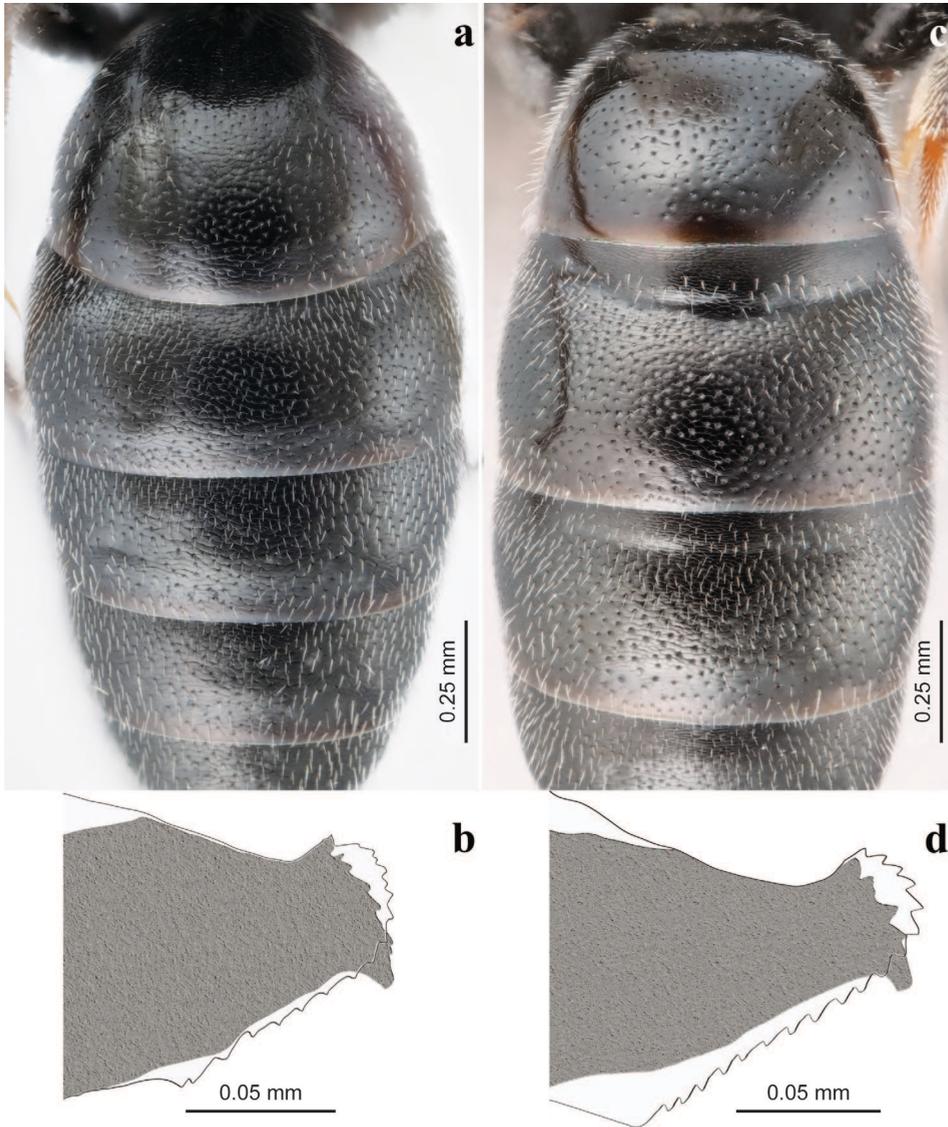


Fig. 4. – *Diodontus* spp. – **a-b**, *D. inalpellatus* n. sp., ♂: **a**, gaster; **b**, tip of penial valve. – **c-d**, *D. luperus* Shuckard, ♂ (France): **c**, gaster; **d**, tip of penial valve.

base, apex digitate with a subtruncate tip. Penial valve tip with conspicuous apical tooth and large dorsal preapical tubercule, inferior membrane reduced, inferior and apical margin lightly indented with small irregular and sparse teeth (fig. 4b).

Derivatio nominis. – This species is named after the Corsican adjective “inalpellatu”, meaning “perched (on the mountain)”.

BOLD Process ID. – LPRCW019-19 (holotype), LPRCW020-19, LPRCW021-19, LPRCW066-19. All these sequences fall within one BIN, BOLD:AAN3316. According to the CO1 sequences available in BOLD, the most closely related species is *D. luperus*. The sequences of *D. inapellatus* have a mean p-distance of 2% with those of *D. luperus* (p-dist range: 1.7-2.5%) and 5.5% with those of *D. wahisi* (p-dist range: 5.1-5.9%).

Remark. – Species restricted to the Corsican mountains where it occurs from 1200 to 1800 m. It is common and might be locally abundant.

Diodontus insidiosus Spooner, 1938 (fig. 5e-f, 6d-f, 7d-f)

Material examined. – 1 ♀, 6 ♂, **Ghisonaccia**, 42.03535°N 9.45678°E, 22.V.2021 (LPR 2019-2021); 1 ♂, **Oletta**, 42.65282°N 9.2939°E, 26.VI.2020 (LPR 2019-2021); 1 ♀, **Patrimonio**, 42.70456°N 9.34107°E, 15.VI.2020 (LPR 2019-2021); 2 ♀, 42.70416°N 9.33943°E, 19.VI.2020 (LPR 2019-2021); 1 ♀, **Sisco**, 42.81755°N 9.42973°E, 25.VI.2020 (LPR 2019-2021); 1 ♂, **Ventiseri**, 41.92231°N 9.41292°E, 21.V.2021 (LPR 2019-2021); 1 ♂, 41.91615°N 9.41204°E, 25.V.2021 (LPR 2019-2021); 1 ♂, 41.91513°N 9.4132°E, 25.V.2021 (LPR 2019-2021).

Remark. – *Diodontus insidiosus* is currently a species complex and many European records of *D. insidiosus* refer to cryptic species. *Diodontus insidiosus* has been described from the United Kingdom so I compared Corsican specimens with British ones (collection Thomas Wood) to confirm the identity of the Corsican population. The same exercise was done with specimens from all over France mainland. No morphological differences have been found so I consider both French and British populations to be conspecific. This species inhabits open, dry, and sandy habitats. It is uncommon in Corsica and seems to be restricted to the plains and coastal areas (0-330 m).

Diodontus touroulti n. sp. (fig. 5a-d, 6a-c, 7a-c)

<https://zoobank.org/NomenclaturalActs/e2a85d06-27e0-4a27-8881-4ecf859f9e5f>

HOLOTYPE: ♂, **Zicavo**, 41.87636°N 9.13275°E, 25.VI.2019-29.VI.2019 (LPR 2019-2021).

PARATYPES: 1 ♀, 3 ♂, **Ghisonaccia**, 42.03156°N 9.45949°E, 18.V.2021 (LPR 2019-2021); 1 ♂, 42.02207°N 9.46957°E, 18.V.2021 (LPR 2019-2021); 2 ♂, 42.03535°N 9.45678°E, 22.V.2021 (LPR 2019-2021); 1 ♀, 1 ♂, **Mausoléo**, 42.49568°N 8.9927°E, 2.VII.2019-5.VII.2019 (LPR 2019-2021); 2 ♀, 42.47891°N 8.92486°E, 4.VII.2019 (LPR2019-2022); 1 ♂, 42.47835°N 8.92559°E, 4.VII.2019 (LPR2019-2022); 1 ♀, 42.49578°N 8.99219°E, 5.VII.2019 (LPR2019-2022); 1 ♀, 42.50988°N 9.00843°E, 6.VII.2019 (LPR2019-2022); 1 ♀, 42.50988°N 9.00843°E, 6.VII.2019; 2 ♀, 42.49487°N 8.99318°E, 6.VII.2019 (LPR2019-2022); 1 ♀, 1 ♂, **Patrimonio**, 42.70456°N 9.34107°E, 15.VI.2020-19.VI.2020 (LPR2019-2022); 1 ♀, 42.69371°N 9.3984°E, 23.VI.2020 (LPR2019-2022); 2 ♂, **Porto-Vecchio**, 41.5745°N 9.3421°E, 26.V.2021 (LPR2019-2022); 1 ♂, 41.57535°N 9.34714°E, 26.V.2021 (LPR2019-2022); 2 ♀, **Santo-Pietro-di-Tenda**, 42.66393°N 9.19723°E, 15.VI.2020-27.VI.2020 (LPR2019-2022); 1 ♀, 1 ♂, **Sisco**, 42.81821°N 9.40376°E, 25.VI.2020 (LPR2019-2022); 3 ♂, 42.81831°N 9.40451°E, 25.VI.2020 (LPR2019-2022); 1 ♀, 2 ♂, **Sorbollano**, 41.76891°N 9.12552°E, 23.VI.2019 (LPR2019-2022); 1 ♂, 41.76877°N 9.12576°E, 23.VI.2019-27.VI.2019 (LPR2019-2022); 1 ♂, 41.76987°N 9.12493°E, 27.VI.2019-11.VII.2019 (LPR2019-2022); 2 ♀, 2 ♂, **Sotta**, 41.529°N 9.22865°E, 19.V.2021 (LPR2019-2022); 1 ♀, **Ventiseri**, 41.91615°N 9.41204°E, 25.V.2021 (LPR2019-2022); 1 ♀, 1 ♂, 41.91513°N 9.4132°E, 25.V.2021 (LPR2019-2022); 1 ♀, 1 ♂, **Zicavo**, 41.87636°N 9.13275°E, 25.VI.2019 (LPR2019-2022); 1 ♀, 41.87636°N 9.13275°E, 29.VI.2019 (LPR2019-2022); 1 ♀, 41.87603°N 9.13184°E,

29.VI.2019 (LPR2019-2022); 1 ♀, 41.87639°N 9.13157°E, 25.VI.2019-29.VI.2019 (LPR2019-2022); 1 ♂, 41.87636°N 9.13275°E, 25.VI.2019-29.VI.2019 (LPR2019-2022).

Additional material. – 1 ♀, **Ajaccio**, 20.VII.1899 (MNHN); 2 ♀, **Bonifacio**, 24.V.1895 (MNHN); 1 ♀, 26.V.1895 (MNHN); 2 ♀, 3.VI.1895 (MNHN); 1 ♀, 1 ♂, 5.VI.1895 (MNHN); 4 ♀, 6.VI.1895 (MNHN); 1 ♀, 8.VI.1895 (MNHN); 1 ♀, 14.VI.1895 (MNHN); 1 ♀, 9.V.1896 (MNHN); 1 ♀, 13.V.1896 (MNHN); 1 ♀, 15.V.1896 (MNHN); 1 ♀, 20.V.1896 (MNHN); 3 ♀, 23.V.1896 (MNHN); 2 ♀, 27.V.1896 (MNHN); 1 ♀, 1 ♂, 28.V.1896 (MNHN); 2 ♀, 30.V.1896 (MNHN); 1 ♀, 31.V.1896 (MNHN); 1 ♀, 16.VIII.1896 (MNHN); 1 ♀, 18.VIII.1896 (MNHN); 1 ♀, 25.IV.1897 (MNHN); 1 ♀, 6.V.1897 (MNHN); 1 ♂, 9.V.1897 (MNHN); 1 ♀, 11.V.1897 (MNHN); 1 ♀, 1 ♂, 19.V.1897 (MNHN); 1 ♀, 11.VI.1897 (MNHN); 2 ♀, 18.VII.1897 (MNHN); 1 ♀, 7.VI.1898 (MNHN); 1 ♀, 23.IV.1899 (MNHN); 1 ♀, 28.IV.1899 (MNHN); 1 ♀, 10.V.1899 (MNHN); 1 ♀, 13.V.1899 (MNHN); 2 ♀, 22.V.1899 (MNHN); 1 ♀, 23.V.1899 (MNHN); 1 ♀, 11.V.1900 (MNHN); 1 ♀, 1.VI.1900 (MNHN); 1 ♂, 9.VI.1900 (MNHN); 1 ♂, 14.VI.1900 (MNHN); 1 ♀, 3.VII.1900 (MNHN); 2 ♀, 21.VI.1901 (MNHN); 1 ♂, 14.VIII.1901 (MNHN); 1 ♂, 14.VIII.1901 (MNHN); 1 ♀, 4 ♂, 8.V.1902 (MNHN); 2 ♂, 27.V.1902 (MNHN); 3 ♀, 3 ♂, 28.V.1902 (MNHN); 1 ♀, 10.VI.1902 (MNHN); 1 ♀, 2.VII.1902 (MNHN); 1 ♀, 5.VII.1902 (MNHN); 1 ♀, 08.VII.1902 (MNHN); 1 ♀, 31.V.1903 (MNHN); 1 ♂, 20.VI.1903 (MNHN); 1 ♂, 31.V.1904 (MNHN); 1 ♀, 17.VI.1905 (MNHN); 3 ♀, 27.VI.1905 (MNHN); 1 ♀, 9.VII.1905 (MNHN); 2 ♀, 30.IX.1906 (MNHN); 1 ♂, 11.VI.1907 (MNHN); 1 ♀, 20.VI.1908 (MNHN); 1 ♀, 10.V.1909 (MNHN); 1 ♀, 4.V.1910 (MNHN); 1 ♂, **Bonifacio, Bastion**, 41°23'16.4"N 9°09'28.5"E, 30.V.2017 (MNHN); 1 ♂, 1.VI.2017 (MNHN); 1 ♂, 2.VI.2017 (MNHN); 1 ♂, 3.VI.2017 (MNHN); 1 ♀, **Bonifacio, La Trinité**, 2.VI.1901 (MNHN); 1 ♀ **Bonifacio, Pertusato**, 41°22'19.1"N 9°10'54.2"E, 9.V.2017 (MNHN); 1 ♀, 41°22'15.7N 9°10'51.8E, 12.VI.2016 (OCIC); 1 ♀, 14.VI.2016 (MNHN); 1 ♀, **Bonifacio, Route de Santa-Manza**, 41°24'02.1"N 9°13'00.4"E, 2.V.2017 (MNHN); 1 ♀, 41°24'01.4"N 9°12'52.4"E, 23.V.2017 (MNHN); 1 ♀, **Bonifacio, Saint Julien**, 41°23'24.7N 9°10'49.2E, 16.V.2017 (MNHN); 1 ♂, 13.VI.2017 (MNHN); 1 ♀, 14.VI.2017 (MNHN); 1 ♀, 4 ♂, **Bonifacio, Santa-Manza**, 4.V.1902 (MNHN); 1 ♀, 41°24'49.1"N 9°14'17.1"E, 17.V.2017 (MNHN); 1 ♀, 41°24'52.1"N 9°14'14.6"E, 23.V.2017 (MNHN); 1 ♂, **Propriano**, 16.VII.1899 (MNHN); 1 ♀, **Vivario, Vizzavona**, 16.VII.1899 (MNHN); 1 ♀, 17.VII.1899 (MNHN).

Diagnosis. – This species belongs to the *minutus* species group: yellow mandibles, black scape, yellow pronotal lobes, deeply emarginate labrum (♀), upper end of orbital gland convex (♀), rakes on the probasitarsi (♀), W6F:PRN>0.09 (♂). The female can be recognised immediately by the combination of yellow mandibles (fig. 5a), black scape, deeply emarginate labrum, and by the reduced rakes on the probasitarsi (fig. 6b). This last important character is rarely used so this species might have been confused with *D. insidiosus* in collections until now. Excluding the reduced rake, the female would key out in the couplet 13 of BUDRYS *et al.* (2019), leading to *D. friesei* Kohl, 1901, from the Near East and the palearctic *D. insidiosus* Spooner, 1938. The frons of *D. touroulti* is as densely punctate as in *D. friesei* but the tegument of the scutum is conspicuously tessellate, the vertex is shorter (LV:LF < 0.55) and the face narrower (lower LID:LF < 0.78), as in *D. insidiosus*. The female is more similar to *D. insidiosus* Spooner, 1938. It differs by the rake of short setae on the outer margin of the probasitarsi (fig. 6b), the longest setae being much shorter than the probasitarsi width (outer margin of probasitarsi with four long white protruding bristles much longer than the probasitarsi width in *D. insidiosus*; see fig. 6e); the two first segments of the protarsi with a short and flat apical spine on their outer margin, reaching at most the 2/3 of the following segment (fig. 6b) (longer in *D. insidiosus*, almost reaching the apex of the following segment; see fig. 6e); the inconspicuous spines of the middle and posterior tarsi (thicker and longer in *D. insidiosus*); the subcontiguous and coarser punctation of the frons, most interspaces being shorter or equal to one PD, rarely more, up to 2-3 PD (fig. 5b) (punctation sparse in *D. insidiosus*, interspaces rarely shorter or equal to one PD, most interspaces measuring between 2-6 PD; see fig. 5e); the orbital gland longitudinally crossed in its length by a shallow median furrow which is

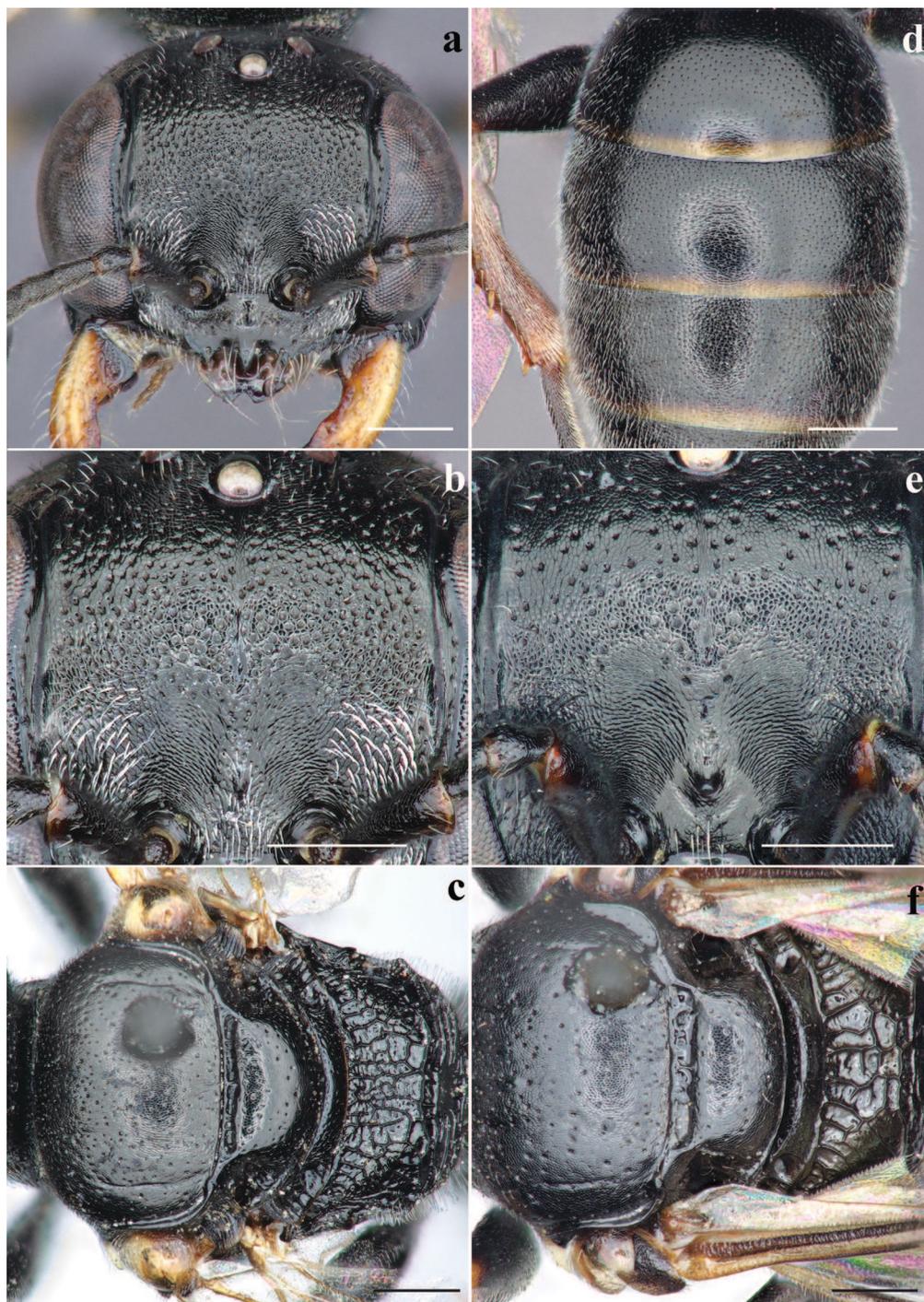


Fig. 5. – *Diodontus* spp. – a-d, *D. touroulti* n. sp., ♀: a, face; b, frons; c, mesosoma in dorsal view; d, T1-3. – e-f, *D. insidiosus* Spooner, ♀ (France, Manche): e, frons; f, mesosoma in dorsal view. Scale bars: 0.25 mm.

much narrower than the convex lateral part of the orbital gland (fig. 5b) (the median furrow is deep and large in *D. insidiosus*, at least as wide as the convex lateral part of the orbital gland; see fig. 5c), the comparatively more densely punctate scutum (fig. 5c, f); the longitudinally lineolate lower mesepisternum below the hypersternaulus (fig. 6a) (mesepisternum covered by many sharp longitudinal carinas separated by large smooth interspaces in *D. insidiosus*; see fig. 6d); the comparatively more finely reticulate dorsal area of the propodeum, with shallow carina forming smaller alveoli (fig. 5c) (carinas remarkably sharp forming large smooth and shiny alveoli in *D. insidiosus*; see fig. 5f).

The male can easily be recognised by the combination of yellow mandibles (fig. 6c), yellow pronotal lobes (fig. 6a), entirely black antennae with placoid on F(8)9-11 (fig. 7a), almost straight pro- and mesobasitarsi, the large hemispherical and glabrous plate on S3-4 (fig. 7b). It has entirely black antennae (fig. 6c, 7a) as *D. oraniensis* (Lepeletier, 1845) and *D. longicornis* (Beaumont, 1960). It can be distinguished from them by the deeply and densely punctate frons (fig. 6c) (punctuation fine and indistinct in *D. oraniensis* and *D. longicornis*), the placoids restricted to F(8)9-11 (fig. 7a) (placoids on F(5)6-11 in *D. oraniensis* and *D. longicornis*), and the median flagellomeres around as long as wide (distinctly longer than wide in *D. oraniensis* and *D. longicornis*). Excluding the black antennae, the male keys out as *D. insidiosus* in the key of BUDRYS *et al.* (2019). It can be distinguished by the entirely black antennae (fig. 6c, 7a) (flagellum yellowish ventrally in *D. insidiosus*; see fig. 6f, 7d); the deep subcontiguous punctuation of the frons with most interspaces shorter or equal to one PD, rarely more (fig. 6c) (shallow and sparse in *D. insidiosus*; see fig. 6f); conspicuous placoids on F9-10, at least as long as half the length of the associated flagellomere, base of F8 and F11 either without placoid or with a minute indistinct one (fig. 7a) (large placoids on F8-10 and small but conspicuous placoids on the base of F7 and F11 in *D. insidiosus*; see fig. 7d); the comparatively more finely reticulate dorsal area of the propodeum (as in female); the comparatively more densely and coarsely punctate mesosternum, especially around the signum (punctuation minute and scarce in *D. insidiosus*), the disc of S3-4 elevated, forming a transverse crescent-shaped plate of which tegument is impunctate, tessellate, matte and, glabrous (fig. 7b) (disc of S3-4 hairy, flat, finely punctate, finely tessellate in *D. insidiosus*; see fig. 7e); S3-5 without notable apical fringe, only very short decumbent setae (fig. 7b) (S3-5 medio-posteriorly with denser and longer pilosity than on remaining part of sternites in *D. insidiosus*, apical fringe of S3-5 made of long setae at least as long as the width of the second segment of the metatarsi; see fig. 7e); S8 apex narrow with a pointy tip (fig. 7c) (large subtruncate tip in *D. insidiosus*; see fig. 7f).

Female description. – Body length 3.8–4.5 mm. Body black; at least basal half of mandibles, pronotal lobes and spot on tegulae yellow; protibiae, mesotibiae anteriorly, metatibiae bright to dark yellow; tip of mandibles dark red to nearly black; tibiae posteriorly and mesally brown to nearly black; tarsi ferruginous to dark brown; pterostigma nearly black with a lighter strip along the edge of wing.

Head transverse (fig. 5a), WH:LF = 1.48-1.53. Face wide, LID:LF = 0.71-0.80. Inner orbits weakly converging apically, LID:UID = 0.85-0.91. Vertex developed, LV:LF = 0.47-0.54, LV:POD = 2.15-2.30. Ocelli forming obtuse triangle, POD:OOD = 0.81-0.91. Genae slightly narrower than the eyes, around 0.8 times as wide as the eyes in lateral view. Occiput carinate. Mandibular condyles widely separated, IMD:WH = 0.71-0.72. Clypeus relatively long, LCL:LF = 0.24-0.28. Clypeus free margin tridentate, relatively narrow, WCA:IMD = 0.25-0.26; mid-tooth as long as lateral teeth. Labrum hemispherical, with small apical notch. Scape moderately long, LSC:LF = 0.37-0.41. Flagellum comparatively short, 3FL:LSC = 0.89-1.0. Flagellomeres distinctly longer than wide, around 1.3-1.5 as long as wide (except F11, two times as long as wide). Lower frons with large impunctate shagreened supra-antennal areas, around two times as long as ASD and as wide as one ASD. Lower frons nearly flat with conspicuous tuber between supra-antennal areas. Upper frons tessellate, silky, with deep subcontiguous punctuation

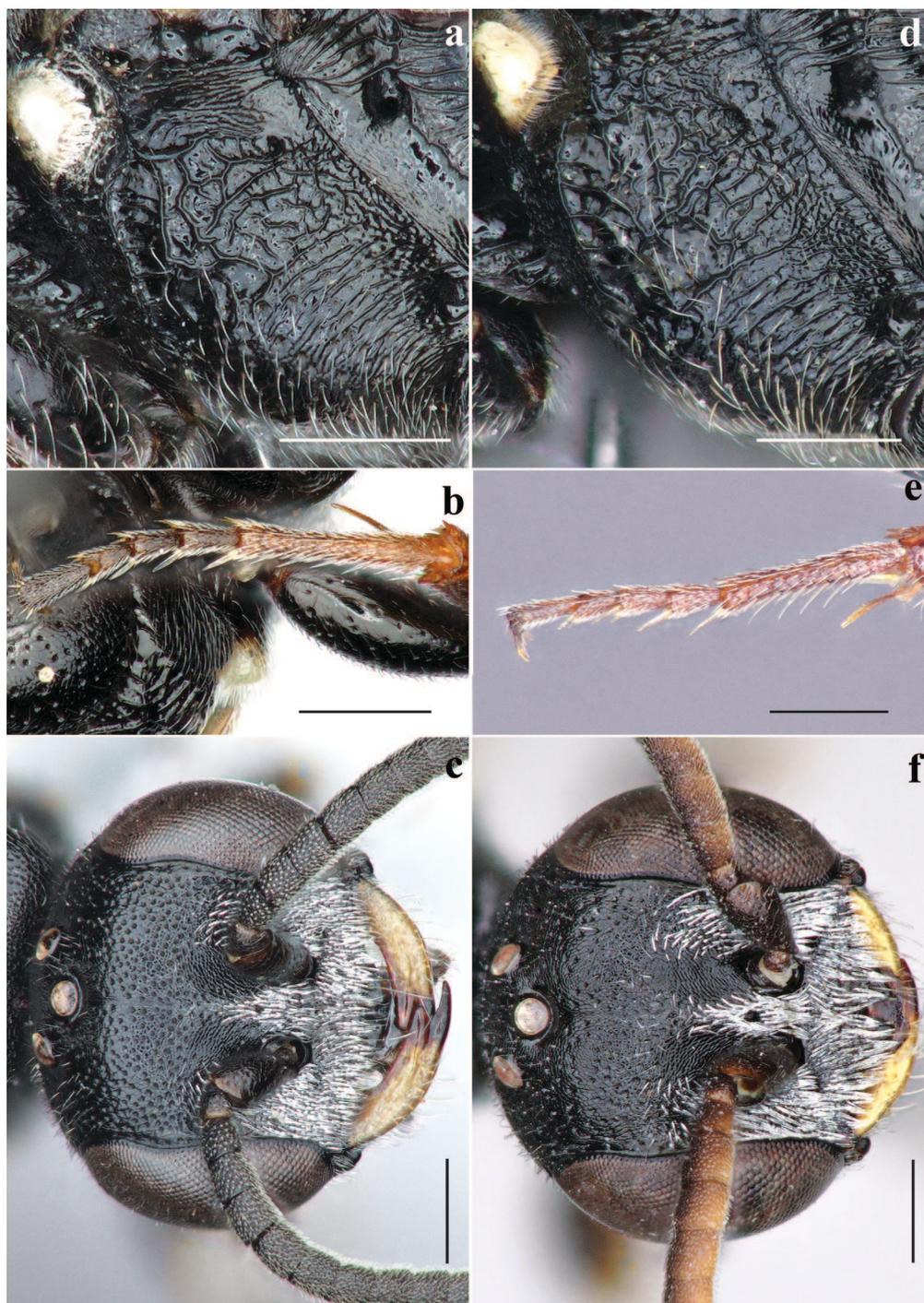


Fig. 6. – *Diodontus* spp. – a-c, *D. touroulti* n. sp.: a-b, ♀ (a, mesopleuron; b, probasitarsus in frontal view); c, ♂, face. – d-f, *D. insidiosus* Spooner (France, Manche): d-e, ♀ (d, mesopleuron; e, probasitarsus in frontal view); f, ♂, face. Scale bars: 0.25 mm.

above supra-antennal areas, most interspaces shorter or equal to one PD, rarely more (up to 2-3 PD) (fig. 5b). Frontal line in front of fore ocellus not impressed. Dorsal part of orbital gland moderately convex, prominence not wider than 0.5 WPO; mid-part wider than distance between it and inner orbit. Pilosity of upper frons short and sparse, shorter than 0.5 WPO. Pilosity of lower frons relatively short, decumbent, and relatively sparse, not concealing an underlying microsculpture. Upper part of clypeus with relatively sparse short pilosity; shiny impunctate area above free margin covers approximately 0.9 of the height of the clypeus. Ventral face of genae with erect setae measuring around 0.5 WPO.

Mesosoma. Pronotal collar of moderate width, COL:PRN = 0.56-0.57, with carinate dorsolateral angles and almost straight dorsal carina (frontal view). Lateral surface of pronotal collar shiny with numerous irregular ridges. Scutum tessellate with irregularly scattered punctation, punctures shallow and dense anteriorly but sparse and deep on the disc, lateral and posterior margin (fig. 5c). Scutellum tessellate with a few shallow punctures, the deep anterior furrow hardly crenulate. Metanotum very finely and scarcely punctate. Propodeal dorsum finely reticulate, reticulation conspicuously denser in the propodeal enclosure, with distinct lateral angles (dorsal view), separated from the propodeum lateral and posterior faces by a thin carina (fig. 5c). Propodeum lateral face silky, longitudinally ridged and not separated from the posterior area by a carina. Propodeum posterior face shiny with several transverse carina and a deep subtriangular median pit. Omaulus present, sharply raised (fig. 6a). Hypoepimeral area longitudinally lineolate, matte, its lower margin carinate. Scrobal sulcus distinct. Prepectus and the upper mesepisternum with a shiny tegument, irregularly reticulate with carinas. Lower mesepisternum silky, longitudinally lineolate with a few distinct punctures below (fig. 6a). Mesosternum tessellate with scarce punctation, punctures conspicuous and deep around signum. Mesosternum covered by short semi-decumbent setae (measuring hardly 0.25 WPO), mesepisternum and mesonotum covered by a shorter pubescence. Upper metapleural area longitudinally carinate, lower metapleural area smooth and shiny. Probasitarsi rakes reduced to a few short erect setae, the longest setae of outer margin much shorter than probasitarsi width (fig. 6b). Protarsi segments with one apical spine on outer margin, at most as long as associated segment width (fig. 6b).

Metasoma. Gastral tergites lightly tessellate, scarcely and minutely punctate (fig. 5d). T1 somewhat more sparsely punctate with shallower shagreen. Pygidial plate subtriangular with a narrow subtruncate tip, tegument with few scarce coarse punctures, moderately shiny, more closely tessellate apically.

Male description. – Body length 3.2-3.8 mm. Coloration similar to that of female with more extended yellow markings on tibiae and basitarsi yellow to entirely black.

Head. Proportions of head similar to those of female: WH:LF = 1.45-1.55, LID:LF = 0.83-0.84, LID:UID = 0.94-0.96, LV:LF = 0.41-0.56, vertex shorter, LV:POD = 1.67-1.90, POD:OOD = 0.9-1.0, IMD:WH = 0.61-0.63, LCL:LF = 0.25-0.28. Genae around 0.75 times as wide as the eyes in lateral view. Occiput carinate. Clypeus free margin bidentate with narrow and deep median notch. Labrum subtrapezoidal, apical margin widely emarginate. Scape moderately long, LSC:LF = 0.31-0.35. Flagellum longer (fig. 7a), 3FL:LSC = 1.12-1.21; F1 slightly shorter than F2 (around 0.9 times as long as F2), median flagellomeres hardly longer than wide (1.1-1.2 as long as wide), L6F:W6F = 1.05-1.2, F11 around two times as long as wide; flagellomere 8 sometimes with minute indistinct placoid, F9-10 with smooth concave and ovoid placoid, at most as long as $\frac{2}{3}$ of associated flagellomere on F9, almost as long as the flagellomere on F10, base of F11 with a small inconspicuous placoid (fig. 7a).

Mesosoma and metasoma. Pronotal collar of moderate width, COL:PRN = 0.54-0.56, with carinate dorsolateral angles and almost straight dorsal carina (frontal view). Microsculpture and pilosity similar to those in female, with following exceptions: upper frons with slightly stronger and denser punctation and more distinct microsculpture (fig. 6c); pilosity of lower frons and clypeus dense and silver, concealing the underlying tegument. Sculpture and pilosity of mesosoma and gaster similar to those of female, with following exceptions: punctation of scutum denser, interspaces 0.8–2.0 times as wide as punctures (rarely more), punctation of scutellum and metanotum denser, propodeal enclosure more finely reticulate than that of female so that alveoli are very small. Probasitarsi and mesobasitarsi weakly bent, mesobasitarsi not dilated. T6 with a pair of apical tubers bearing 2-3 small brown spines; T7 with subtrapezoidal punctate pygidial plate, delimited by distinct carina, slightly shorter than wide basally (around 0.8 times).

S3-4 with elevated disc, forming a transverse crescent-shaped plate with impunctate, glabrous and tessellate tegument, remaining sternites lightly tessellate, finely punctate, uniformly pubescent with short and sparse decumbent setae (fig. 7b). S8 with a triangular base and narrow pointy tip (fig. 7c). Penial valve with acute apex and small dorsal preapical tubercule.

Derivatio nominis. – This species is dedicated to Julien Touroult (MNHN).

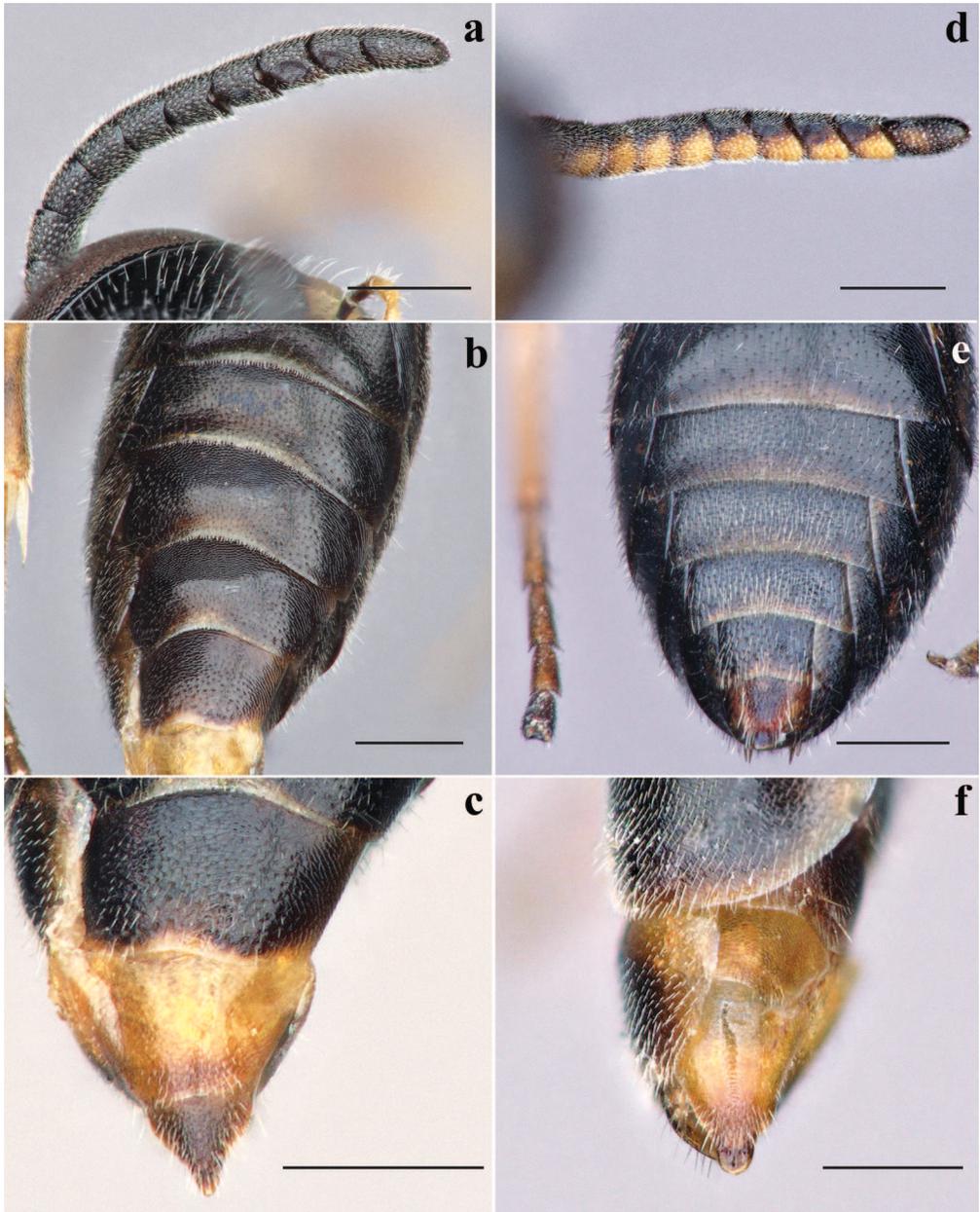


Fig. 7. – *Diodontus* spp. – **a-c**, *D. touroulti* n. sp., ♂: **a**, posterior face of right antenna; **b**, gaster in ventral view (S2-S7); **c**, Sternite 7. – **d-f**, *D. insidiosus* Spooner, ♂ (France, Manche): **d**, Posterior face of right antenna; **e**, gaster in ventral view (S2-S7); **f**, Sternite 7. Scale bars: 0.25 mm.

BOLD Process ID. – LPRCW029-19, LPRCW030-19, LPRCW031-19 (Holotype), LPRCW067-19. All these sequences fall within one BIN, BOLD:AEC3598. According to the available CO1 sequences in BOLD, *D. touroulti* appears as a basal clade in the whole *minutus* species-group. It is therefore related to *D. major* Kohl, 1901, *D. minutus s. l.* and *D. insidiosus s. l.* Both *D. insidiosus s. l.* and *D. minutus s. l.* consist of diversified species complex made of misidentified and cryptic species. The mean p-distance with these species complexes is 8.8% (p-dist range: 8-9.9%) and 9% (p-dist range: 7.4-10.5%), respectively. The mean p-distance with *D. major* is 8.4% (p-dist range: 8.4-8.8%).

Remark. – This is a very common species occurring in warm and dry habitats in the plains (including coastal areas) and in the mountains (up to 1700m). It is the commonest species in Corsica. It was observed in the same stations as *D. inalpellatus* and *D. insidiosus*. FERTON (1905 : 73) described the behaviour and ecology of this species in Bonifacio under the name of *D. minutus*.

Diodontus tristis (Vander Linden, 1829)

Material examined. – 3 ♀, Bonifacio, 27.VI.1905 (MNHN).

Remark. – The ecology of *D. tristis* in Bonifacio was described by FERTON (1908 : 563). There are no modern records. In mainland France, this is a relatively uncommon species which prefers anthropized environments (LE DIVELEC *et al.*, 2022). Targeted sampling in gardens and extensive cultivated lands may lead to a rediscovery of this species in Corsica.

DISCUSSION

The examination of 208 Corsican specimens suggests that four species of *Diodontus* occur in Corsica. Two are new for science (*D. inalpellatus*, *D. touroulti*) and one is new for the island (*D. insidiosus*). The last one, *Diodontus tristis*, is only known by historic records. The Corsican records of *D. minutus* resulted from misidentification and refers to *D. touroulti*. The record of *D. friesei* by PAGLIANO (2009), listed as *D. hyalipennis* in BITSCH *et al.* (2022), also resulted from a misidentification. As a matter of fact, the diagnosis provided for *D. friesei* by PAGLIANO & NEGRILOSO (2005) does not match its original description but obviously refers to something much closely related to *D. insidiosus*, if not *D. insidiosus* itself. In the past, many cryptic species closely related to *D. insidiosus* were recorded from the Mediterranean peninsulas (including Italy) as “*D. aff. friesei*” (LECLERCQ, 1974; BUDRYS *et al.*, 2019). However, *D. friesei* only occurs outside of Europe and *D. hyalipennis* is probably a distinct Caucasian species (BUDRYS *et al.*, 2019). Further investigations are needed to precise the taxonomy and distribution of the European species.

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