

## Case 2638

*Apis terrestris* Linnaeus, 1758, *A. muscorum* Linnaeus, 1758 and *A. lucorum* Linnaeus, 1761 (currently *Bombus terrestris*, *B. muscorum* and *B. lucorum*) and *Bombus humilis* Illiger, 1806 (Insecta, Hymenoptera): proposed conservation of usage of the specific names

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**Abstract.** The purpose of this application is the conservation of the established usage of the specific names of four common species of European bumble bees, all now placed in the genus *Bombus* Latreille, 1802. This usage is in agreement with the original descriptions of the species, but lectotype designations for *B. terrestris* (the type species of *Bombus*) and *B. muscorum* have been made which, if followed, would have the following consequences: *B. terrestris* would be called *B. audax*, *B. lucorum* would become *B. terrestris*, *B. muscorum* would be called *B. laevis*, and *B. humilis* would become *B. muscorum*. These changes, especially the name transfers, would be very confusing and it is proposed that they be avoided by the designation of neotypes for *B. terrestris* and *B. muscorum*.

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1. Linnaeus (1758, p. 578) described *Apis terrestris* as 'A[*pis*] hirsuta nigra, thoracis cingulo flavo, ano albo ... Habitat in Europae terra ...'; he cited eight earlier references but mentioned no specimens. The nominal species *A. terrestris* is the type by monotypy of *Bombus* Latreille, 1802 (p. 437); this generic name was placed on the Official List in Opinion 220 (March 1954) but no mention was made of the taxonomic sense (i.e. typification) of *A. terrestris* itself.

2. The collection of the Linnean Society of London contains four specimens under the name *A. terrestris*. Three queen specimens are mounted in the same row; the first of these is labelled 'terrestris' while the others are unlabelled. In her revision of Scandinavian bumble bees Løken (1973, p. 53) pointed out that only the third queen is in agreement with the accepted taxonomic use of the name *terrestris*, but in order to maintain stability she continued to use the name 'in sensu past and present authors'. Løken considered that two of the Linnean Society specimens were females of *Bombus lucorum* (Linnaeus, 1761) as understood by authors; Linnaeus had described this species from the male (see para. 6 below).

3. Day (1979, p. 74) noted that the third queen in the Linnean Society collection (see previous para.) is a specimen of *B. terrestris* auct. but of British origin (as shown by its buff tail segment: continental specimens are white in this respect (cf. Linnaeus's description 'ano albo' in para. 1 above)). Day designated the first (labelled) queen as the lectotype of *Apis terrestris* and the second as a paralectotype, although he noted that this lectotype is not in accord with the stable concept of the name (see para. 11 below).

4. One of us (P.R.) has studied Day's lectotype and paralectotype of *A. terrestris* and concluded that, rather than belonging to *B. lucorum* (see para. 2 above), they are possibly specimens of *Bombus cryptarum* (Fabricius, 1775 (p. 379)), which is a species very closely related to *B. lucorum* (see Rasmont et al., 1986).

5. The specific name of *Apis audax* Harris, [1776] (p. 130) has been used for British specimens of *B. terrestris* auct. (see Day, 1979, p. 74), and *audax* could replace *terrestris* for this species if Day's lectotype designation were followed. Even more confusing, the name *B. terrestris* would be transferred to the *B. lucorum* of authors (or possibly to *B. cryptarum*). Williams (1985, 1986) used the names *B. audax* and *B. terrestris* in this way but authors in general have not adopted the consequences of Day's lectotype designation for *Apis terrestris*.

6. Linnaeus (1761, p. 425) described *Apis lucorum*, which he based on male specimens from Sweden. Day (1979, p. 66) designated a labelled male in the Linnean Society collection as lectotype, and this is in accord with the established usage of the name.

7. Linnaeus (1758, p. 579) described *Apis muscorum*, citing three references but mentioning no specimens; he had previously described the species as early as 1736. In the collection of the Linnean Society there are three specimens (two queens, one of which is labelled '32 muscorum', and one worker) under this name, but they are conspecific with *Bombus humilis* Illiger, 1806 (p. 171) and in disagreement with Linnaeus's description and the accepted usage of the name *muscorum*. The discrepancy between the description and the labelled specimen was pointed out by Krüger (1932, p. 148) and Richards (1935, p. 74), although Day (1979, p. 68) said 'It agrees with description'. Richards considered that the Linnean Society specimen(s) may not be pre-1758 material, and in the interest of stability deliberately maintained the use of *B. muscorum* 'for the species which is universally known by that name at the present time'; Løken (1973, p. 146) did the same.

8. In 1947 H. Boschma, acting on behalf of the nomenclature committee of the Nederlandse Entomologische Vereniging, forwarded an application (originally formulated by G. Kruseman of the Amsterdam Zoological Museum) to the Commission Secretary (F. Hemming) asking for conservation of 'the well-known name *Bombus muscorum* Linné, 1758 in the sense of Fabricius and later authors'. Hemming (May 1947) requested 'an up-to-date statement by a specialist in the group concerned regarding the identity of the specimen in the Linnean collection' but this was not forthcoming and no further action was taken. Hemming took the view that 'there is extremely little evidence to support the allegation (sometimes made) that J.E. Smith added other specimens after he acquired the collection [in 1784]', but in fact specimens of Hymenoptera were added after 1757 in Sweden and later also by Smith (see Day & Fitton, 1978, p. 183); presumably this had happened in the case of the British specimen of *A. terrestris* (para. 3 above).

9. Day (1979, p. 68) designated the female specimen in the Linnean Society collection labelled '32 muscorum' (see para. 7 above) as the lectotype of *Apis muscorum* Linnaeus, 1758, despite its discrepancy with the original description of the species and the established usage. This designation has the effect of transferring the name *muscorum* to the species known as *Bombus humilis* Illiger, 1806 and of requiring a valid replacement name for *B. muscorum* as it has long been understood. Day (1979, p. 68) suggested that the name *laevis*, published by Vogt (1909, p. 63) as *B. muscorum laevis*, 'may be [the] next available name for the species commonly known as *B. muscorum*'. Williams (1985, 1986) adopted *B. muscorum* for *B. humilis* auct. and *B. laevis* for *B. muscorum* auct., although expressing reservations in the earlier paper, but the double name change resulting from Day's lectotype selection has not been generally followed.

10. We seek conservation of the long established and current usage of the specific names of *Bombus terrestris*, *B. lucorum*, *B. humilis* and *B. muscorum*, and in particular to avoid the transfer of names between species. The names have been used in a stable sense by numerous workers in hundreds of publications (e.g. Løken, 1973; Alford, 1975; Pekkarinen, 1979; Rasmont, 1983; Rasmont, 1984; Hagen, 1986; Rasmont et al., 1986; Prys-Jones & Corbet, 1987); the Commission Secretariat has a list of 21 such publications in addition to those mentioned in this application. Macfarlane (1988, p. 8), supporting our approach to the Commission over these cases, wrote 'I consider changing the useage away from the longstanding and traditional use does not serve science well ... a situation has arisen ... in which confusion in the taxa is being generated for scientists other than taxonomic specialists ... The literature on these four species is confusing enough without compounding the difficulties by letting a gradual or incomplete change in the meaning of the names to occur. *B. terrestris* and *B. lucorum* are amongst the best known species of bumble bees, which are well known insects of economic value'. Macfarlane mentioned that *B. terrestris* had been introduced into New Zealand, where it was of importance in the pollination of lucerne and kiwifruit. He stated that he had received support for the conservation of the traditional sense of the *Bombus* names from 'eminent researchers who deal with bees from France, Belgium, the United States, Chile, and New Zealand, and only one objection from the United Kingdom'.

11. In making his lectotype designations in a contrary sense, Day (1979) himself noted (p. 78) 'Names are here applied in strict accordance with the International Code of Zoological Nomenclature, irrespective of current usage. The current application of the names *Bombus muscorum* (L.), *B. humilis* Illiger, *B. lucorum* (L.), *B. terrestris* (L.) ... may well be considered worthy of conservation by interested zoologists by suspension of the rules by the International Commission on Zoological Nomenclature'.

12. The usage of the four specific names mentioned in the previous paragraph can be conserved by setting aside the lectotypes designated by Day (1979) for *Apis terrestris* and *A. muscorum* Linnaeus, 1758, and then designating neotypes in accord with the established understanding of the names. We propose as neotypes two specimens from Sweden, now in the Naturhistoriska Riksmuseet, Stockholm. The specimen of *A. terrestris* is a queen with a red label reading NEOTYPE *Apis terrestris* L., 1758 A. Pekkarinen des. 1994' and a blue label reading 'Upl. Rådmansö Västernäs 7.8.1970 leg. S. Erlandsson *Bombus terrestris* (L.) A. Løken

det. Naturhistoriska Riksmuseet Stockholm Loan 262/94'. The specimen of *A. muscorum* is also a queen, labelled in red 'NEOTYPE *Apis muscorum* L., 1758 A. Pekkarinen des. 1994' and in blue 'Sk. Arkelstorp 5.7.1947 B.O. Landin *Bombus muscorum* L., A. Løken det. Naturhistoriska Riksmuseet Stockholm Loan 268/94'.

13. The International Commission on Zoological Nomenclature is accordingly asked:

- (1) to use its plenary powers to set aside all previous fixations of type specimens for the nominal species *Apis terrestris* and *A. muscorum* Linnaeus, 1758, and to designate the first and second specimens mentioned in para. 12 above as the respective neotypes;
- (2) to add to the entry for *Apis terrestris* Linnaeus, 1758 on the Official List of Specific Names in Zoology the endorsement that the nominal species is defined by the neotype designated in (1) above;
- (3) to place the following names on the Official List of Specific Names in Zoology:
  - (a) *muscorum* Linnaeus, 1758, as published in the binomen *Apis muscorum* and as defined by the neotype designated in (1) above;
  - (b) *lucorum* Linnaeus, 1761, as published in the binomen *Apis lucorum* and as defined by the lectotype designated by Day (1979);
  - (c) *humilis* Illiger, 1806, as published in the binomen *Bombus humilis*.

## References

- Alford, D.V. 1975. *Bumblebees*. 352 pp. Davis-Poynter, London.
- Day, M.C. 1979. The species of Hymenoptera described by Linnaeus in the genera *Sphex*, *Chrysis*, *Vespa*, *Apis* and *Mutilla*. *Biological Journal of the Linnean Society* (London), 12: 45–84.
- Day, M.C. & Fitton, M.G. 1978. Re-curation of the Linnaean Hymenoptera (Insecta), with a reassessment of the taxonomic importance of the collection. *Biological Journal of the Linnean Society* (London), 10: 181–198.
- Fabricius, J.C. 1775. *Systema Entomologiae*, ... xxxii, 832 pp. Kortii, Flensburgi et Lipsiae.
- Hagen, E. von. 1986. *Hummeln*. 224 pp. Neumann, Melsungen.
- Harris, M. [1776–1780]. *Exposition of English Insects*. viii, 166 pp., 53 pls. Author, London.
- Illiger, J.C.W. 1806. William Kirby's Familien der Bienenartigen Insecten mit Zusätzen, Nachweisungen u. Bemerkungen. *Magazin für Insektenkunde*, 5: 28–175.
- Krüger, E. 1932. Über die Farbvariationen der Hummelart *Bombus agrorum* Fabr. II Teil. *Zeitschrift für Morphologie und Ökologie der Tiere*, 24: 148–237.
- Latreille, P.A. 1802. *Histoire naturelle des Fourmis*, ... xvi, 445 pp., 12 pls. Barrois, Paris.
- Linnaeus, C. 1758. *Systema Naturae*, Ed. 10, vol. 1. 824 pp. Salvii, Holmiae.
- Linnaeus, C. 1761. *Fauna Suecica*, Ed. 2. 578 pp. Salvii, Stockholmiae.
- Løken, A. 1973. Studies on Scandinavian bumble bees (Hymenoptera, Apidae). *Norsk Entomologisk Tidsskrift*, 20: 1–218.
- Macfarlane, R.P. 1938. *Bombus terrestris* (L.): does a change in its useage really serve science? *Melissa*, 3: 7–9.
- Pekkarinen, A. 1979. Morphometric, colour and enzyme variation in bumblebees (Hymenoptera, Apidae, *Bombus*) in Fennoscandia and Denmark. *Acta Zoologica Fennica*, 158: 1–60.
- Prys-Jones, O.E. & Corbet, S.A. 1987. *Bumble bees*. *Naturalists' Handbook*, no. 6. 86 pp. Cambridge University Press, Cambridge.
- Rasmont, P. 1983. Catalogue commenté des bourdons de la région ouest-paléarctique (Hymenoptera, Apoidea, Apidae). *Notes fauniques de Gembloux*, 7: 1–71.
- Rasmont, P. 1984. Les bourdons du genre *Bombus* Latreille *sensu stricto* en Europe Occidentale et Centrale (Hymenoptera, Apidae). *Spixiana*, 7: 135–160.

- Rasmont, P., Scholl, A., Jonghe, R. de, Obrecht, E. & Adamski, A. 1986. Identité et variabilité des mâles de bourdons du genre *Bombus* Latreille *sensu stricto* en Europe occidentale et centrale (Hymenoptera, Apidae, Bombinae). *Revue suisse de Zoologie*, 93: 661-682.
- Richards, O.W. 1935. *Bombus muscorum* (Linnaeus) and *B. smithianus* White (Hym.). *Transactions of the Society for British Entomology*, 2: 73-85.
- Vogt, O. 1909. Studien über das Artproblem. Über das Variieren der Hummeln. *Sitzungsberichte der Gesellschaft Naturforschender Freunde zu Berlin*, 1909: 28-84.
- Williams, P.H. 1985. A preliminary cladistic investigation of relationships among the bumble bees (Hymenoptera, Apidae). *Systematic Entomology*, 10: 239-255.
- Williams, P.H. 1986. Environmental change and the distributions of British bumble bees. *Bee World*, 67: 50-61.