**Supplementary Materials**

**Sampling of specimens**

***Table S1:*** Specimens for the molecular and morphological analysis: taxa; islands with region; sex; locality with altitude m a.s.l., latitude and longitude; date of collection; collector abbreviation; voucher code; further remarks; molec = molecular analysis, morph = morphological analysis

**Morphometric parameters and analysis**

***Table S2:*** Morphometric data of the different taxa in mm.

**Parameters of the morphological analysis**

***Table S3****:* Morphological parameters used for the comparative analysis.

***Table S4:*** Morphological parameters: group analysis

***Table S5:*** Data matrix of morphological analysis.

***Text S1***

***Habitat preferences of species of the A. wollastoni group***

For the *Andrena* species studied here, the following habitat conditions are prerequisits: a specific ecoclimate, a sufficient spectrum of flowering plants (especially Brassicaceae and Asteraceae) for nectar and pollen, and suitable sites for fossorial nesting (Kratochwil 2003, Kratochwil & Schwabe 2020). The temporal-spatial development of a volcanic island restricts colonisations by such wild bee species often to specific historical time windows.

It is remarkable that all taxa of the studied group on the Canary Islands live in thermozones with notable humidity or in the high-elevation mesocanarian/supracanarian zones: *A. catula*, *A. gomerensis* (high-elevation zones not in La Gomera, only in La Palma), *A. acuta*, *A. lineolata*. The extreme hot infracanarian zone in the lower areas seems to be not a suitable habitat, with the exception of special sites with more moisture(Kratochwil & Schwabe 2020). In contrast, the Madeira Archipelago is characterised by climatic conditions generally not as extreme. *Andrena wollastoni* (Madeira Island) was detected in all vegetation zones and altitudes of the island, which is also true for *A. dourada* on Porto Santo (Kratochwil & Schwabe 2018, Kratochwil et al. 2019).

Regarding their flower-visiting behaviour, Asteraceae and Brassicaceae play a major role in pollen collection. Females of *A. catula* and *A. wollastoni* used Asteraceae as their main pollen resource, females of *A. dourada*, *A. gomerensis*, *A. acuta,* and *A. lineolata* usedBrassicaceae. Especially in the montane-subalpine zones of Tenerife *(A. acuta wildpreti, A. lineolata*), females showpreferences for species of Brassicaceae. Concerning the habitats, *A. wollastoni* is a supergeneralist in the sense of Olesen et al. (2002). The habitats preferentially used by *A. wollastoni* are those with ruderal vegetation (e.g., road margins, fallow land, margins of crop fields). There are also habitats in the natural landscape, e.g., disturbance sites of barrancos, gaps in laurel forests, rocky slopes, also rocky areas near the coast) present before human colonisation.

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***Text S2***

***Background: The taxonomic position of the Andrena wollastoni group within the genus Andrena and the subgenus Micrandrena***

* **Species diversity in *Andrena* and *Micrandrena***

An overview of the phylogeny of *Andrena* based on morphology was given by Dubitzky et al. (2010) which, based on molecular methods by Dubitzky (2006) and as well with molecular methods (UCE sequences) by Pisanty et al. (2021), we update. More than 1450 valid *Andrena* species of this genus with a mainly Holarctic distribution have been described to date (Gusenleitner & Schwarz 2002). There are more than 90 Palaearctic species within the subgenus *Micrandrena* listed in Gusenleitner & Schwarz (2000); meanwhile over 100 *Micrandrena* species with Palaearctic distribution are known. Many of the subspecies described by Warncke (Blank & Kraus 1994) are with high probability species and have partly already been upgraded to the species level (Kratochwil 2020).

In the studies of Dubitzky (2006) and Pisanty et al. (2021) only 3% of about 100 *Micrandrena* species of the Palaearctic were analysed by molecular methods, all with an exclusively European distribution. It would be an exciting task to assign our results from the *A. wollastoni* group to the classification of Pisanty et al. (2021), but there are no molecular data available for *Micrandrena* species of North Africa. The species of the *A. wollastoni* group (Kratochwil 2020) have their origin in species or ancestors of the *A. tiaretta* group (Kratochwil & Scheuchl 2013, Kratochwil 2015), which comprises exclusively North African species. We did not have access to fresh material of North African *Micrandrena* species (e.g., *Andrena spreta* Pérez, 1895*, A. tiaretta* Warncke, 1974, etc.) to sequence, therefore we used European *Micrandrena* species which can be assigned to *Micrandrena* III (Pisanty et al. 2021) as an outgroup, which are closely related to each other (*Andrena enslinella*, *A. minutuloides*, *A. semilaevis*, *A. subopaca*).

* **Morphological differentiation of the *Andrena wollastoni* group compared to other *Micrandrena* species**

Kratochwil & Scheuchl (2013) pointed out that the members of the *A. wollastoni* group differ from other species of the subgenus *Micrandrena* in some morphological characteristics. These features are the longitudinally grooved structures in the frons and in the supraclypeal and paraocular areas, the facial foveae narrowed below, and the propodeal triangle with fine structures without obvious rugulae. These morphological cues occur only in few cases within other species of *Micrandrena*. Another difference from other species of *Micrandrena* is the sharp pointed penis valvae. For most of all other species in the subgenus *Micrandrena*, such a feature is missing (excluding, e.g., *A. tiaretta*, *A. fabrella* Pérez, 1903, which demonstrate a close relationship to the *A. wollastoni* group). Females of the *A. wollastoni* group are characterised by some morphological features which occur in species of the subgenus *Distandrena*. This is discussed in Kratochwil & Scheuchl (2013). But a comparison, e.g., with analyses of Dubitzky (2006), rejects a close relationship between *Micrandrena* and *Distandrena*. A characteristic feature of the species of the *A. wollastoni* group is the very shallow, slightly cratered punctation found in the thoracic region of all species of the *A. wollastoni* and *A. tiaretta* groups, whereas the European species are clearly and more deeply punctate. **It can therefore be stated that the *A. wollastoni* group is largely isolated (monophyletic) within the subgenus *Micrandrena*.** Comparative analyses are currently lacking to allow assignment of the *A. wollastoni* group to a subgenus of its own. Morphological differences between the species of the *A. wollastoni* group and mainland European species of the subgenus *Micrandrena* are also confirmed by the results of the molecular genetic analysis presented here.

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**Figure S1:** Bayesian phylogenetic tree obtained with MrBayes on the basis of mDNA sequences. Six different *Micrandrena* species were used as outgroups. Scale bar in units of expected substitutions per site. The colours of the specimen labels correspond to those used in Fig. 1 and Fig. 2.

