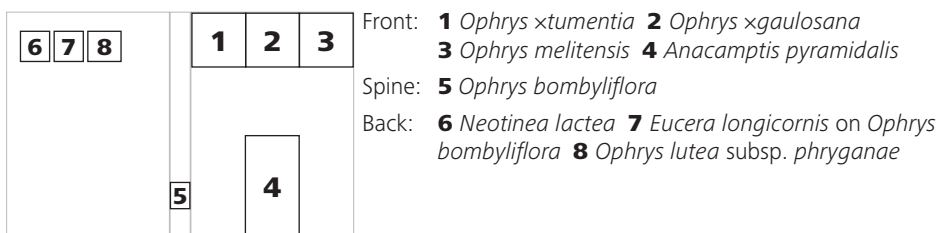


ORCHIDS OF THE MALTESE ISLANDS

a descriptive guide



by Stephen Mifsud



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TABLE 1. Comparison of *Ophrys iricolor* subsp. *mesaritica*, subsp. *vallesiana* and subsp. *lojaconoi* from Malta (adapted from MIFSUD, 2008; MIFSUD & LEWIS, 2013) and subsp. *eleonora* (adapted from DELFORGE, 2006).

Diagnostic characters	<i>O. iricolor</i> subsp. <i>mesaritica</i>	<i>O. iricolor</i> subsp. <i>vallesiana</i>	<i>O. iricolor</i> subsp. <i>lojaconoi</i>	<i>O. iricolor</i> subsp. <i>eleonora</i>
No. of flowers	2–5	3–10	3–5	2–5
Plant height (cm)	6–18	12–35	15–30	25–50
Sepal length (mm)	11–13	12–14	11–13	12–14
Petal length (mm)	6–8	7–9	6–8	8–10
Lip length (mm)	12–15 (mean 13 mm)	14–19 (mean 16 mm)	12–15 (mean 13 mm)	15–26 (mean 18 mm)
Labellum colour	dull brown with a purple tinge	dull brown with a purple tinge	dull brown with a purple tinge	dull brown with a purple tinge
Underlip colour	Entirely green, or sometimes tinged pale reddish at the centre; with or without an evident green border	Red or pink with a distinct yellowish-green border; sometimes entirely green	Red or pink with a yellowish-green border (not always very distinct); sometimes entirely green	Pink or orange with a distinct yellowish-green border; rarely entirely green
Lateral lobes	Large	Large	Small	Large
Crests at base of lip	Moderately defined, sometimes weak or obscure	Well defined, large	Moderately defined, sometimes weak or obscure	Well defined, large
Flowering period in Malta	Mid-December to early February	End of February to early April	Mid-February to mid-March	End of March to early May*
Geographical distribution	Tunisia, Malta, (?Sicily), Greece, Crete	Tunisia, Malta, (?Sicily)	Southern Italy, Malta, (?Sicily)	Corsica, Sardinia

*Flowering period as reported from populations overseas

The *Ophrys lutea* group

The situation of the *Ophrys lutea* group in the Maltese Islands is currently unresolved, however the taxa of this group can be proposed based on the morphological assessment of many local populations examined in the field. Up until the 1980s, records in historic literature were under the broad taxon *Ophrys lutea* without giving any reference to or morphological notes on the size, colour or outline shape of the lip. The second taxon within the *O. lutea* group was first reported in Malta by SCHEMBRI et al. (1987) as *O. lutea* subsp. *murbeckii* (H.Fleischm.) Soó, which was then reported again in the Red Data Book of the Maltese Islands (LANFRANCO, 1989). This is now known to be a hybrid between *O. fusca* Link and *O. sicula* Tineo, and in fact, further studies revealed that this yellow bee orchid corresponded to subsp. *sicula* (Tineo) Soldano (BARTOLO et al., 2001). By the early 2000s, two species within the *O. lutea* group were confirmed from Malta - the large-lipped subsp. *lutea* and the small-lipped subsp. *sicula* - and at the time it was assumed that the latter is more frequent on the Maltese Islands (LANFRANCO, 1989; BARTOLO et al., 2001).

The presence of a third subspecies, *O. lutea* subsp. *phryganae* (Devillers-Terschuren & Devillers) Melki, was first reported from Bingemma and Għar il-Kbir by MIFSUD (2008) and later recorded from four other stations. This orchid has an intermediate morphology between the other two subspecies and the major differences are summarised in **TABLE 1**. The observations and measurements of specimens of *O. lutea* s. l. taken by Stephen Mifsud from the Maltese Islands between 2008 and 2018 are shown in **TABLE 2**. The characters of specimen 16 clearly correspond with those of subsp. *sicula*. Most of the characters of the other specimens match with subsp. *phryganae*, with the exception of the measurements of the lip length (15–16 mm) of a few specimens which overlap between this subspecies and subsp. *lutea*. The

inconsistency in lip measurements has previously been reported by HENNECKE (2017), who proposed that the angle between the longitudinal axis of the lip and the margin (refer to FIG. 5) is a much better criterion than the length of the lip to discriminate between the three subspecies, as well as their hybrids. Bearing this in mind, the character set of a few specimens recorded from Malta (specimen number 11 and possibly 3) match more closely with subsp. *lutea* than with subsp. *phryganae*, however these specimens do not exhibit the typical form of subsp. *lutea* because of their shorter lip (FIG. 3B) and the presence of remnant brown markings in the median lobe.

The confusion within the *O. lutea* complex in Malta is exemplified by the record from Għar il-Kbir (FIG. 6) which was first determined as subsp. *lutea* by Richard Lorenz and later on as subsp. *sicula* by Michael Briffa (BARTOLO et al., 2001) and Stephen Mifsud (MIFSUD, 2008). On re-examining the specimen and taking into account additional distinguishing characters, especially the lip angle, the individual was re-determined as subsp. *phryganae* by Stephen Mifsud in 2010. This confusion within the *O. lutea* complex has also been noted in southern Italy (e.g. GIROS, 2013).

TABLE 1. Most significant diagnostic characters to distinguish *Ophrys lutea* subsp. *sicula*, subsp. *phryganae* and subsp. *lutea* (adapted from DELFORGE, 2006; PEDERSON & FAURHOLDT, 2007; HENNECKE, 2017, 2018).

Diagnostic characters	<i>O. lutea</i> subsp. <i>sicula</i> (FIG. 1)	<i>O. lutea</i> subsp. <i>phryganae</i> (FIG. 2)	<i>O. lutea</i> subsp. <i>lutea</i> (FIG. 3)
Lip length (mm)	7–11	12–15	15–18
Curvature of lip and orientation with the stigmatic cavity (FIG. 4)	Flat, perpendicular to the stigmatic cavity	Geniculated (kinked down), about 45° to the stigmatic cavity	Geniculated (kinked down), about 45° to the stigmatic cavity
Horn-shaped marking on the median lobe	Dark and well-defined	Reduced, partial or faded	Absent
Angle between the longitudinal axis of the lip and the margin at the uppermost part (close to the stigmatic cavity) (FIG. 5)	About 45°	About 60°	About 80°

TABLE 2. Measurements and characters of *O. lutea* s. l. from the Maltese Islands.

Specimen no.	Location and date	Lip length (mm)	Lip angle (FIG. 5)	Geniculation at the base of the lip	Brown horn-shaped markings on the yellow border of the median lobe
1	Għar il-Kbir (17 Mar. 2008)	13.5	63°	Weak	Remnant
2	Pembroke (10 Mar. 2009)	14.0	n/a	Yes	Very small, emarginate
3	Ta' Kuljat, Żebbuġ, Gozo (10 Apr. 2009)	16.0	59°	Yes	Remnant
4	Bingemma 1 (25 Mar. 2009)	15.0	65°	Yes	Reduced in size
5	Bingemma 2 (25 Mar. 2009)	15.5	n/a	Yes	Reduced and faded
6	Bingemma 3 (25 Mar. 2009)	14.0	60°	Yes	Reduced in size
7	Bingemma 4 (25 Mar. 2009)	15.0	66°	Yes	Remnant
8	Bingemma 5 (25 Mar. 2009)	16.0	n/a	Yes	Almost complete
9	Bingemma 6 (25 Mar. 2009)	13.0	n/a	Yes	Almost complete
10	Bingemma 7 (25 Mar. 2009)	14.5	n/a	Yes	Reduced and faded
11	Bingemma 8 (12 Mar. 2018)	16.0	72°	Yes	Remnant
12	Bingemma 9 (12 Mar. 2018)	14.5	62°	Yes	Complete but faded
13	Bingemma 10 (12 Mar. 2018)	13.5	66°	Yes	Remnant
14	Bingemma 11 (12 Mar. 2018)	15.0	66°	Yes	Reduced in size
15	Bingemma 12 (12 Mar. 2018)	12.5	61°	Yes	Absent
16	Bingemma 13 (12 Mar. 2018)	10.5	45°	No	Prominent, dark
17	Żurrieq (27 Mar. 2014)	14.0	67°	Yes	Reduced in size
18	Nadur, Gozo (Monika Trinkler, 29 Mar. 2018)	11.5	65°	Yes	Remnant



FIG. 1. *Ophrys lutea* subsp. *sicula*, characterised by a small lip (c. 10–11 mm long), perpendicular to the stigmatic cavity and without a geniculation at the base, the angle of emergence (FIG. 4) of about 45° and the presence of distinct brown markings in the yellow border of the median lobe.



FIG. 2. *Ophrys lutea* subsp. *phryganae*, characterised by a medium-small lip (c. 14–15 mm long), inclined at 45° to the stigmatic cavity and with a prominent geniculation at the base, angle of emergence about 60° and with small or incomplete brown markings in the yellow border of the median lobe.



FIG. 3. *Ophrys lutea* subsp. *lutea* characterised by a large lip (c. 16–17 mm long), inclined at 45° to the stigmatic cavity and with a prominent geniculation at the base, angle of emergence (FIG. 4) about 80° and lack of or reduced brown markings in the yellow border of the median lobe.



FIG. 4. Angle between the plane of the lip and the stigmatic cavity (perpendicular in this example of *Ophrys lutea* subsp. *sicula*).

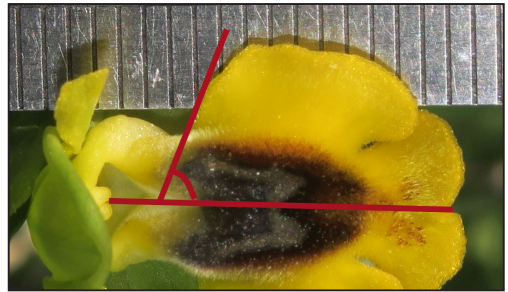


FIG. 5. Angle between the longitudinal axis of the lip and the margin at the uppermost part, close to the stigmatic cavity (64° in this example of *O. lutea* subsp. *phryganae*).



FIG. 6. *Ophrys lutea* subsp. *phryganae* from Ghar il-Kbir, Siġġiewi (17 Mar. 2010).

To conclude, a plausible interpretation of the *O. lutea* group in the Maltese Islands is that three subspecies occur:

- 1 subsp. *phryganae*, a recent taxon which was not known in Malta until 2008, possibly replacing many of the previous records of subsp. *lutea* and subsp. *sicula*;
- 2 subsp. *sicula*, which is very rare but confirmed from Bingemma by Stephen Mifsud (specimen 16, **TABLE 2**) and recorded from Dingli Cliffs by Anthony Bonnici in 1989 (verified through photographic evidence provided by Michael Briffa);
- 3 subsp. *lutea*, although the examined specimens were not typical forms (**FIG. 3**) or were not observed in homogeneous clumps as it is regularly found, for example, in Sicily (**FIG. 7** and **FIG. 8**), but were found isolated as individual plants or found within or close to clumps of subsp. *phryganae*.

Unfortunately, most historic records of *O. lutea* s. l. lack diagnostic measurements or photographs, therefore it is impossible to determine which subspecies within the *Ophrys lutea* complex they should be ascribed to.

Some conservative classifications (those that lump taxa together) do not accept the taxon subsp. *phryganae* and simply synonymise it with *O. lutea* s. str. (e.g. PEDERSEN & FAURHOLDT, 2007; DIMOPOULOS et al., 2013). This lumping approach would imply a taxonomic problem for the *O. lutea* group in Malta because the morphology of many individuals, for example those with a lip measuring 13–15 mm long, fall in between and can neither be placed within subsp. *sicula* nor with subsp. *lutea*. Fortunately, the work by HENNECKE (2017), which provides a better understanding of subsp. *phryganae* (treated as *O. phryganae* Devillers-Terschuren & Devillers in his work), should make this orchid more widely accepted as a subspecies and establish clear-cut distinctive morphological characters and a biogeographical rationale.

HENNECKE (2017, 2018) and previous accounts (e.g. MELKI, 1999; GIROS, 2016) consider *O. lutea* subsp. *phryganae* to be a hybrid species between subsp. *lutea* and subsp. *sicula*. The geographic distribution of the three *lutea* taxa discussed here also seems to support the hybrid hypothesis. *O. lutea* subsp. *lutea* is distributed in western Europe (Spain, Portugal, Algeria, etc.) and is gradually replaced by subsp.



FIG. 7. Typical form of *Ophrys lutea* subsp. *lutea* from Vittoria, Sicily (26 Mar. 2018).



FIG. 8. Homogenous individuals in a sizeable clump found at Vittoria, Sicily (26 Mar. 2018).

sicula towards the east (Greece, Crete, Aegean Islands, Turkey, etc.), whereas subsp. *phryganae* bears a central-eastern Mediterranean distribution, namely southern Italy (including Sicily), Greece (including Crete, the type locality) and Malta, and is therefore located in a territory which overlaps the distribution of the two putative parents aforementioned (see FIG. 9).

Another species similar to the *O. lutea* group subspecies discussed so far is *O. glabra* Pers. from Maghreb in Tunisia. While, DELFORGE (2016) reported the taxon *O. glabra* as a distinct species and questions its relationship with subsp. *lutea* from Malta, Sicily and the southern Iberian peninsula, HENNECKE (2017) suggested that it should be classified as an insignificant variation within *O. lutea* s. l. The lip length of 17–18 mm falls within the upper range of *O. lutea*, as does the obtuse angle between the margin of the lateral lobe and the central longitudinal axis of the lip, and the glabrous speculum character is too weak to define *O. glabra* as a distinct species.

With regards to the situation on the Maltese Islands, this account takes a rather splitting approach and recognises three taxa of the *Ophrys lutea* group that occur in the Maltese Islands ranked as subspecies: subsp. *sicula* (very rare), subsp. *lutea* (doubtful as the observed individual was not typical) and subsp. *phryganae* (scarce, considered as a hybrid between subsp. *lutea* and subsp. *sicula*). This classification concurs with the current classification in Italy (GIROS, 2016), while HENNECKE (2017, 2018) classifies them at species ranking. Further examination of the populations of the *O. lutea* group in Malta, Sicily and the central Mediterranean region is strongly recommended especially since, according to HENNECKE (2018), the three yellow bee orchids hybridise to produce morphologically distinct intermediates, namely *O. calchasii* Romolini & Soca (subsp. *sicula* × subsp. *phryganae*) and *O. sulphurea* Gennaio & Medagli (subsp. *lutea* × subsp. *phryganae*), neither of which have been reported from Malta or Sicily. Moreover, the three subspecies and their hybrids also hybridise with *O. fusca* Link s. l., forming interesting and complex hybrid swarms.

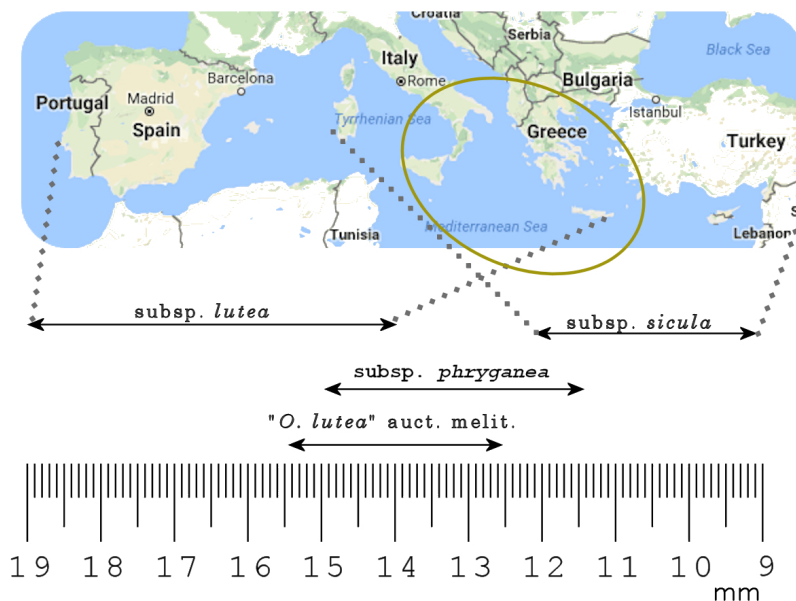


FIG. 9. Distribution map of *Ophrys lutea* subsp. *lutea*, subsp. *phryganae* (green ellipse) and subsp. *sicula*, and the respective length of their lip.