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Epipactis persica subsp. *persica* (*Orchidaceae*), a new taxon for the flora of Greece

Key words
Orchidaceae, *Epipactis persica* subsp. *persica*, Flora of Greece, Conservation.

Summary
Tsiftsis, S. (2010): *Epipactis persica* subsp. *persica* (*Orchidaceae*), a new taxon for the flora of Greece.- J. Eur. Orch. 42(3/4): 477-486.
On the island of Lesvos, *Epipactis persica* subsp. *persica* was discovered as a new taxon for the Greek flora. Information concerning its distribution and habitat preferences as well as population size were studied which are provided in this article. In addition, conservation measures have been proposed which will favor and may ensure the long-term persistence of this particular rare orchid.

Zusammenfassung
Tsiftsis, S. (2010): *Epipactis persica* subsp. *persica* (*Orchidaceae*), ein neues Taxon für die Flora von Griechenland.- J. Eur. Orch. 42(3/4): 477-486.
Auf der Insel Lesvos konnte *Epipactis persica* subsp. *persica* neu für die Flora von Griechenland nachgewiesen werden. Die Ergebnisse der Untersuchung von Verbreitung, Habitatansprüchen und Populationsgröße der Art werden hier mitgeteilt. Schutzmaßnahmen zur nachhaltigen Sicherung des Vorkommens dieser besonders seltenen Orchidee werden vorgeschlagen

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Introduction

Genus *Epipactis* Zinn appears to be among the most complex and controversial in the *Orchidaceae* family. The number of species and subspecies of *Epipactis* have increased over time. SUNDERMANN (1980) refers to 17 species and subspecies that are distributed in Europe and in other countries around the Mediterranean, while DELFORGE (2006) specifies the corresponding number of species and subspecies for the same geographical area as 59.

Owing to the phytogeographical position of Greece, that is, as the country is close to three continents, it is especially rich in *Epipactis* taxa. Further, the relatively extensive explorations that have been conducted in the past decades have caused an increase in the number of *Epipactis* taxa that are found in Greece with the discovery of new species and subspecies for the Greek flora taxa [e.g. *E. pontica* and *E. atrorubens* subsp. *spiridonovii* by TSIFTSIS & al. (2007) and *E. condensata* by DELFORGE (2008)]. In addition, some other *Epipactis* taxa have been described as new for the science. As a result, Greece hosts species of northern (e.g. *E. palustris*) and eastern (e.g. *E. tremolsii* subsp. *turcica, E. pontica, E. condensata*) origin, whereas some others are Greek endemics (e.g. *E. halacsyi, E. olympica, E. cretica*).

Like all the east Aegean islands, the island of Lesvos was connected to the Turkish mainland during the Pleistocene glaciations. Consequently, the flora of the island is strongly affected by the Anatolian flora, with several taxa being of eastern origin (STRID & TAN 1997). The results of various field excursions conducted in the past 25 years concerning the orchid flora of the island have been published (GÖLZ & REINHARD 1981; GÖLZ & REINHARD 1989; BIEL 1998; BIEL 1999). These results indicate that the orchid flora of Lesvos clearly exhibits the influence of both the Cyclades and southern Greece as well as Anatolia.

In the beginning of June 2010, during a field study of the species of genus *Epipactis* in the chestnut forests of the Lesvos Island, a small population of an unknown taxon was located which was not flowered yet. On June 20, 2010, the author visited the same area once again and identified the unknown *Epipactis* as the Anatolian *E. persica* subsp. *persica*.

Materials and methods

During the investigation, data concerning the distribution of *E. persica* subsp. *persica*, the number of individuals, as well as the habitat types were recorded.

In addition, morphometric measurements were taken in the flowering individuals that were found. Subsequently, one herbarium specimen was deposited in the personal herbarium of the author, while a number of flowers were deposited in alcohol.

Results and discussion

According to the existing literature, four taxa of the genus *Epipactis* have been reported until now from the island of Lesvos. GÖLZ & Reinhard (1981) referred to *Epipactis atrorubens* and *E. helleborine* as the only *Epipactis* taxa of Lesvos, while a few years later, they (GÖLZ & REINHARD 1989) added *E. microphylla* to the list of the taxa of the genus that have been found in Lesvos. During his excursions in the island of Lesvos, BIEL (1998) found the following taxa: *E. helleborine*, *E. tremolsii* subsp. *turcica*, and *E. microphylla*. The report of *Epipactis atrorubens* from the islands of Lesvos and Samos refers to an *Epipactis* taxon with reddish-brownish hypochile and epichile. According to DELFORGE (2008: 102) and personal observations from Lesvos and Samos, this taxon has been identified as *Epipactis densifolia*, and it has also been found in Kos (DELFORGE 2009: 70-72) and Chios (DELFORGE & SALIARIS 2007: 64).

Epipactis persica subsp. *persica* was first described from Iran (RENZ 1974) and its distribution area extends from the west coast of Turkey to the Himalayas in the east, extending in the north up to Georgia and Armenia, while reaching the southern coasts of Turkey in the south (DELFORGE 2006; VAKHRAMEEVA & al. 2008: 169; KREUTZ & ÇOLAK 2009: 141). According to RENZ & TAUBENHEIM (1984: 467), it is a highly variable taxon as regards the size and the shape of its leaves. Although several plants have been identified as *E. persica* from the European beechwoods, their status remains unclear and requires further investigation. Records from Denmark refer to *E. confusa* (DELFORGE 2006), while those from central Pindus (Greece) (VERGOS 1995) and Bulgaria (SIERING & HENNING 1990) refer to *E. persica* subsp. *gracilis* (ROSSI & al. 1990) which is widely distributed in the beech forests of central and northern Greece as well as Bulgaria. On the contrary, the only confirmed European record referring to *E. persica* subsp. *persica* has been obtained from the delta of the Danube in Romania (WUCHERPFENNIG 2008).

Description

Based on the findings of RENZ & TAUBENHEIM (1984) and the personal morphometric measurements, *Epipactis persica* subsp. *persica* can be described as follows:

- Rhizomatous, perennial herb; stems 1-2, 15-60 cm, slender.
- Leaves (2)3-4, spreading, ovate, 3-6 × 1.5-3.5, obtuse to slightly acuminate, arranged in the middle part of stem, lowest c.10 cm above ground level.
- Raceme with 5-20 flowers. Lower bract leaf-like, acuminate, c. (2)3-4.5 × 1-2 cm.
- Flowers spreading horizontally (nodding after anthesis). Perianth patent to campanulate, to 15 mm diameter.
- Sepals and petals greenish, with a tinge of red. Hypochile brownish-green inside, containing nectar; epichile triangular acuminate, somewhat reflexed, with two smooth greenish to reddish bosses at base. Autogamous. Iranian and Caucasian plants possess efficient viscidia in fresh flowers, which in hot summers may dry quickly and become inefficient, followed by facultative autogamy (RENZ 1978: 41; BAUMANN & al. 2006: 90) (see also Fig. 5).
- Flowering time: mid June to mid July depending on the microclimatic conditions of the habitat.

Habitat and population data

Epipactis persica subsp. *persica* has been found to occur in wet places of shaded *Castanea sativa* stands above the village of Agiassos (SE of Agiassos) (Fig. 1). Two subpopulations have been found, which are close to each other. In both cases, these subpopulations were very local with a small number of individuals. The altitudinal range of the two localities is c. 700-750 m and the geological substrate of the *Castanea sativa* stands is dominated by schists.

In the first locality (UTM_{WGS84} square 35S MD 42.73), almost twenty individuals were found to occur in an area of about 150-200 m^2. This locality is on a north-west facing slope with a small inclination. In the second locality (UTM_{WGS84} square 35S MD 42.73), only four individuals were recorded. This locality is in a west facing steep slope, also in a shaded *Castanea sativa* stand. On the contrary, it has not been found in other localities of the *Castanea sativa* forest of the Agiassos area.

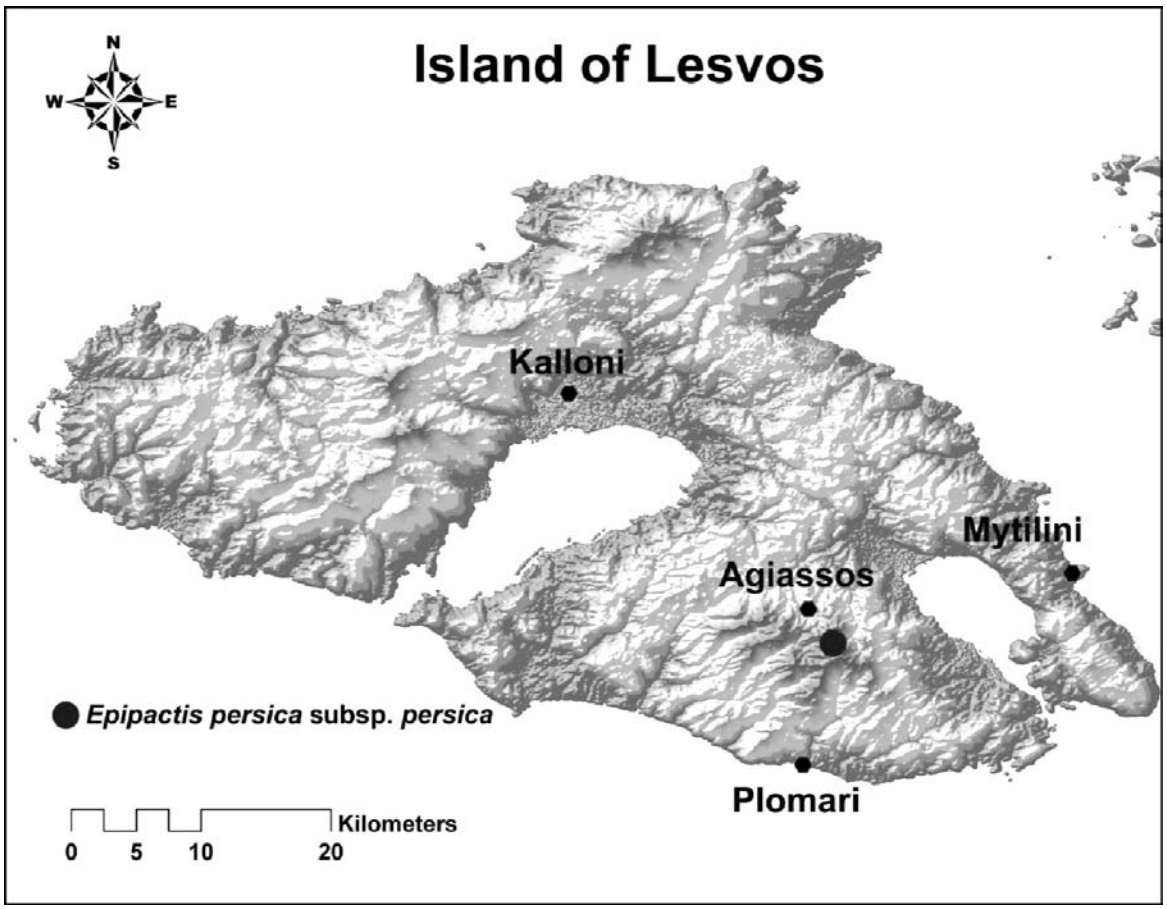

Fig. 1. Map of the island of Lesvos indicating the distribution of *Epipactis persica* subsp. *persica*.

Other orchids that have been found occurring in the localities of *Epipactis persica* subsp. *persica* were *Cephalanthera longifolia, Platanthera holmboei, E. microphylla, E. helleborine,* and *E. densifolia*.

The localities of *E. persica* subsp. *persica* in the island of Lesvos represent the westernmost limit of its distribution. In Turkey, according to the map provided by RENZ & TAUBENHEIM (1984: 588) and KREUTZ & ÇOLAK (2009: 143), *E. persica* subsp. *persica* is mainly distributed in the northern parts of the country, while it has also been recorded in one locality (in one 10 × 10 km grid cell) in the European Turkey and in one locality (in one 10 × 10 km grid cell) on Mt. Ida. Mt. Ida is located close to the western coast of the country at a relatively small distance from the island of Lesvos. The present distribution of *E. persica* subsp. *persica* in the western parts of Turkey and in Lesvos might denote a wider distribution of it in the past or simply the ability of its seeds to disperse in such distances. As it is a taxon occurring in Lesvos in *Castanea*

sativa stands with high levels of soil moisture, it should not be expected that its distribution area would be extensive enough. This is owing to the fact that extensive areas of these forests are situated in relatively dry sites with conditions that are unsuitable for the occurrence of *E. persica* subsp. *persica* (DELFORGE 2006).

Further, as a result of drought, several individuals have withered without the initial flowering and without being pollinated. Despite the fact that *E. persica* subsp. *persica* is autogamous, the low number of flowering individuals could have resulted in reduced seed production and reduced probabilities for the establishment of new individuals.

Consequently, the small number of individuals combined with the restricted area of occurrence have led to the evaluation of *E. persica* subsp. *persica* as Critically Endangered (CR: criterion D) according to the IUCN criteria (I.U.C.N. 2001).

Conservation measures proposed

For several years, the *Castanea sativa* forest of Agiassos has been extensively used for its timber, as well as for chestnut production. In recent times, although traditional practices have been terminated, the road network that has been constructed has destroyed a major stream in which several individuals of *E. persica* subsp. *persica* might have been distributed. Further, forest clearings as well as intensive grazing by sheep and goats could cause harm to the remaining population of *E. persica* subsp. *persica*. Also, soil compression caused by grazing, together with the high level of solar radiation caused by the forest clearings can reduce the moisture in the soil. These factors will have negative effects on the short-term as well as on the long-term existence and survival of the *E. persica* subsp. *persica* individuals.

Taking into account the above mentioned threats, an effective conservation measure for the subpopulations of *E. persica* subsp. *persica* would involve the fencing of the localities in which it has been recorded. In addition, these subpopulations could be monitored which would provide scientists and the local forest authorities with valuable information concerning the biology and ecology of *E. persica* subsp. *persica*. Thus, these stands could be managed in an appropriate manner so as to ensure the long-term persistence of the orchid.

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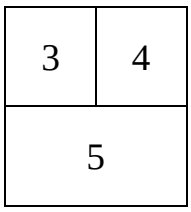

Fig. 3-5: *Epipactis persica* subsp. *persica*, Greece, Lesvos Island, Agiassos, MD 42.73, 700-750 m, 20.06.2010 (fot. S. Tsiftsis).

Fig. 2: *Epipactis persica* subsp. *persica*, Greece, Lesvos Island, Agiassos, MD 42.73, 700-750 m, 20.06.2010 (fot. S. Tsiftsis).