

THE GENUS *EPIPACTIS* IN ANDALUCÍA (SPAIN)

Michael R. LOWE

Samenvatting

Er wordt een overzicht gegeven van de verspreiding van zeven soorten *Epipactis* in Andalusië, ZW-Spanje. *Epipactis cardina* is een recentelijk beschreven soort, voorkomend in Almería; *E. lusitanica* is wijd verspreid in het westen; *E. microphylla* en *E. kleinii* (*E. parviflora* auct.) komen in het oosten voor; *E. palustris* is heel zeldzaam in Jaén; *E. phyllanthes* is onlangs ontdekt in de Sierra Nevada en *E. tremolsii* is wijd verspreid.. Men is van mening, dat *Epipactis helleborine* s. str. en *E. atrorubens* in Zuid-Spanje niet voorkomen - eerdere meldingen zijn opnieuw geëvalueerd.

Zusammenfassung

Es wird eine Verbreitungsübersicht von sieben *Epipactis*-Arten in Andalusien, SW-Spanien, gegeben. *Epipactis cardina* ist eine neulich beschriebene Art und wächst in Almería; *E. lusitanica* hat eine weite Verbreitung im Westen; *E. microphylla* und *E. kleinii* (*E. parviflora* auct.) kommen im Osten vor; *E. palustris* ist sehr selten in Jaén; *E. phyllanthes* ist neulich in der Sierra Nevada entdeckt worden und *E. tremolsii* ist weit verbreitet. Man ist der Meinung, dass *Epipactis helleborine* s. str. und *E. atrorubens* in Südspanien nicht vorkommen - frühere Angaben wurden Neubewertet.

Introduction

This paper reviews the distribution of the Genus *Epipactis* in Andalucía, Spain in the light of current taxonomic knowledge and from field investigations from 1986 to 2001.

The traditional list of Spanish *Epipactis* taxa in national, regional, provincial and local floras comprised *E. helleborine*, *E. atrorubens*, *E. palustris* and *E. microphylla*, the approach set out in Flora Europaea (Moore, 1980). In their work on the Spanish *Epipactis*, Nieschalk & Nieschalk (1971) reported *E. microphylla* for the first time in Mediterranean Spain (Jaén), *E. atrorubens* from Cádiz, *E. helleborine* from Málaga, described *E. atrorubens* subsp. *parviflora* from Albacete and Jaén and drew attention to an overlooked and "dubious" species described by Pau (1914) as *E. tremolsii* from Catalonia. Further field work and revi-



sion of herbarium specimens led Klein (1979) to revise the nomenclature to *E. parviflora* and *E. helleborine* subsp. *tremolsii*.

Tyteca (1988) described *E. lusitanica* from southern Portugal and the Sierra de Aracena in the Province of Huelva, Spain. The distribution was extended to Málaga by Claessens et al. (2000) and to Sevilla by Lowe (2000). Benito Ayuso & Hermosilla (1998) described *E. cardina* from the Sistema Ibérico and the distribution was extended to Andalucía by Lowe (2000). Further species of *Epipactis* were added to the flora of Andalucía by Pajaron-Sotomayor (1989) with a report of *E. palustris* from Jaén and Lowe (2000) with reports of *E. phyllanthes* from the Sierra Nevada in Granada and Almería provinces. Crespo et al. (2001) named *E. kleinii* as a substitute for the name *E. parviflora* (A. & C. Niesch.) E. Klein, an illegitimate later homonym of *E. parviflora* (Blume) A. A. Eaton.

Accounts of European orchids (Sundermann, 1980; Baumann & Künkele, 1982; Davies & Huxley, 1983; Delforge & Tyteca, 1984; Buttler, 1991; Baumann & Künkele, 1988 & Delforge, 1994) recognised *E. tremolsii* as more widely distributed from North Africa to France and *E. parviflora* distributed further north into the Pyrenees. However, the distribution and identification of *E. helleborine* and *E. atrorubens* in Spain and Portugal remained problematic, with some accounts doubting the existence of these taxa in central and southern Spain.

Multivariate analyses of the allogamous western European *Epipactis*, together with ecological data, enabled Tyteca & Dufrêne (1994) and Tyteca (1995a & b) to conclude that *E. helleborine* s. str., *E. tremolsii*, *E. lusitanica*, *E. atrorubens* and *E. parviflora* are well defined, clearly separable entities. The morphological and ecological range of *E. tremolsii* was extended, to included populations with some characters of *E. lusitanica* on acidic soils, whilst *E. lusitanica* was considered a more specialised entity with a narrower morphological and ecological range. Many previous records of *E. atrorubens* and *E. helleborine* were considered to be attributable to *E. tremolsii* or *E. lusitanica*.

In Portugal, Tyteca (1997) has shown that *E. tremolsii* is locally but widely distributed, whilst *E. lusitanica* has a restricted distribution in southern Portugal and the Sierra de Aracena, Spain. *E. atrorubens* was considered absent, with previous records referable to *E. tremolsii* or *E. lusitanica*. The status of *E. helleborine* s. str. in Portugal was reported (Tyteca & Caperta, 1999) as confined to a small number of northern locations, in woodlands more characteristic of central Europe.

In the light of the above studies and investigations in the field from 1986 to 2001, the records of *Epipactis* from Andalucía have been reappraised.

2. *Epipactis* records in Andalucía

Epipactis cardina Benito & Hermos.

Prov. Almería, WG4730, 1200m, El Chaparral (Pallarés Navarro, 1999 as *E. atrorubens*)

Prov. Almería, WG6771, 1225m, Los Alámicos, 06.07.00 (Lowe, 2000)
 Prov. Almería, WG6960, 1050m, Cerro Castaño (Pallarés Navarro, 1999 as *E. atrorubens*)
 Prov. Almería, WG6970, 1500m, El Gayubal (Pallarés Navarro, 1999 as *E. atrorubens*)
 Prov. Jaén, WH1123, 1195m, Casa del Agua de los Perros, 08.07.00 (Lowe, 2000). This record is doubtful, following discussion with J. Benito Ayuso

Epipactis lusitanica D. Tyteca

Prov. Huelva, PB89, Sa. de Aracena (Rivera & Cabezero, 1985 as *E. helleborine*)
 Prov. Huelva, PB99, Sa. de Aracena (Rivera & Cabezero, 1985 as *E. helleborine*)
 Prov. Huelva, PB9895, 595m, SSE Los Romeros, 09.05.01
 Prov. Huelva, PB9997, 670m, S Jabugo, 08.05.01
 Prov. Huelva, PB9398, 600m, 1.2k ESE Cortegana, 14.05.88 (Tyteca, 1997)
 Prov. Huelva, PC81, Sa. de Aracena (Rivera & Cabezero, 1985 as *E. helleborine*)
 Prov. Huelva, PC90, Sa. de Aracena (Rivera & Cabezero, 1985 as *E. helleborine*)
 Prov. Huelva, PC9901, 535m, W Las Chinas, 09.05.01
 Prov. Huelva, QB09, Sa. de Aracena (Rivera & Cabezero, 1985 as *E. helleborine*)
 Prov. Huelva, QB09, Castaño del Robledo, Pico Castaño, 14.06.80 (Silvestre, 1983 as *E. helleborine*)
 Prov. Huelva, QB0399, 600m, 2.5k ESE Galaroza, 21.05.90 (Tyteca, 1997)
 Prov. Huelva, QB0499, 650m, 3.8k ESE Galaroza, 13.05.88 (Tyteca, 1997)
 Prov. Huelva, QB0898, 750m, 6.4k W Aracena, 13.05.88 (Tyteca, 1997)
 Prov. Huelva, QB0097, 670m, Castaño del Robledo, 08.05.01
 Prov. Huelva, QB0193, 560m, NNE Santa Ana La Real, 08.05.01
 Prov. Huelva, QB0695, 640m, NE Alajar, 08.05.01
 Prov. Huelva, QB0997, 715m, S Los Marinos, 09.05.01
 Prov. Huelva, QB19, Sa. de Aracena (Rivera & Cabezero, 1985 as *E. helleborine*)
 Prov. Huelva, QB1497, 690m, NW Aracena, 10.05.01
 Prov. Huelva, QB1599, 550m, W Carboneras, 10.05.01
 Prov. Huelva, QC00, Sa. de Aracena (Rivera & Cabezero, 1985 as *E. helleborine*)
 Prov. Huelva, QC0100, 580m, 0.5k ESE Galaroza, 21.05.90 (Tyteca, 1997)
 Prov. Huelva, QC0400, 670m, La Suerte, 09.05.01
 Prov. Huelva, QC0802, 450m, N Cortelazor, 09.05.01
 Prov. Huelva, QC1500, 570m, W Carboneras, 10.05.01
 Prov. Sevilla, TG6898, 610m, N Constantina, 01.05.00 (Lowe, 2000)
 Prov. Sevilla, TH6803, 675m, Cerro del Hierro, 01.05.00 (Lowe, 2000)
 Prov. Sevilla, TH6414, 700m, Loma Humorada, 01.05.00 (Lowe, 2000)
 Prov. Sevilla, TH6510, 660m, SE Alanís, 01.05.00 (Lowe, 2000)
 Prov. Sevilla, TH6817, 600m, E La Nava, 01.05.00 (Lowe, 2000)
 Prov. Cádiz, TE7194, 380m, Sa. del Cabrito, El Cuartón, 07.05.01
 Prov. Cádiz, TF7772, 300m, Río de El Bosque, 10.05.01
 Prov. Málaga, TF9736, 380m, near Casares, 21.04.95 (Claessens et al., 2000)
 Prov. Málaga, TF9736, 380m, E Casares, 07.05.01
 Prov. Málaga, TF9949, 780m, Algotocín - Jubrique, 12.05.01
 Prov. Málaga, TF9750, 550m, Algotocín - Jubrique, 12.05.01
 Prov. Málaga, TF9572, 795m, Los Alcornocales, 11.05.01
 Prov. Málaga, UF0447, 780m, 3k SE Jubrique, 12.05.01
 Prov. Málaga, UF4140, 20m, near Elviria, 10.04.95 (Claessens et al. 2000)
 Prov. Málaga, UF4140, 20m, Elviria, N Las Chapas Hotel, 07.05.01

Epipactis microphylla Sw.

- Prov. Jaén, VG2657, 1195m, SW Valdepeñas de Jaén, 10.06.01
Prov. Jaén, WG0395, 1340m, E Parador del Adelantado, 28.05.96 (Lowe, 2000)
Prov. Jaén, WH3032, 1345m, Horno Peguera, 07.07.00 (Lowe, 2000)
Prov. Jaén, WH34, 1700m, Siles - C.F. Acebeas, E Orcera, 06.70 (Nieschalk, 1971)
Prov. Jaén, WH3740, 1325m, Acebeas - Navalcaballo, 25.06.99
Prov. Granada, VF6488, 1380m, Casa Forestal de Prado Grande, 03.07.00 (Lowe, 2000)
Prov. Granada, VF7388, 1220m, W Busquístar, 04.07.00 (Lowe, 2000)
Prov. Granada, VF7592, 1470m, SW Treveléz, 04.07.00 (Lowe, 2000)
Prov. Granada, VG9311, 1405m, Bco. de los Tejos, 21.06.99 (Lowe, 2000)
Prov. Granada, WH3504, 1495m, Sa de Guillimona, 24.06.99 (Lowe, 2000)

Epipactis palustris (L.) Crantz

- WH3328, 1070m, 0,6k S Venta del Collado, 07.07.00
WH3426, 1100m, Bco. del río Madera, 10.07.78 (Pajaron-Sotomayor, 1989)

Epipactis kleinii M. B. Crespo, M. R. Lowe & J. Piera

- Prov. Jaén, WG09, Sa. Cazorla, W of Parador (Nieschalk, 1971)
Prov. Jaén, WG0495, 1215m, E Parador del Adelantado, 28.05.96
Prov. Jaén, WG0794, La Mesas, nr. Nava del Espino, 24.07.74 (Charpin & Fernández Casas, 1975 as *E. helleborine*). This record may be *E. cardina*
Prov. Jaén, WH00, Sa. Cazorla, Arroyo (Bouillie et al., 1992 as *E. helleborine*)
Prov. Jaén, WH0918, 1105m, La Parra, Sa. de las Villas, 08.07.00 (Lowe, 2000)
Prov. Jaén, WH0822, 1190m, La Escalera de Amador, 08.07.00
Prov. Jaén, WH1223, 1195m, S Casa del Agua de los Perros, 08.07.00
Prov. Jaén, WH1324, 950m, Arroyo Martín, Sa. de las Villas, 08.07.00 (Lowe, 2000)
Prov. Jaén, WH22, Sa. Segura, S Hornos (Nieschalk, 1971)
Prov. Jaén, WH2824, 1470m, Potones - La Garganta, 24.06.99
Prov. Jaén, WH2930, 1095m, La Garganta, 25.06.99
Prov. Jaén, WH2756, 1100m, Coll Los Yesos - Villarrodrigo, 25.06.99
Prov. Jaén, WH3332, 1160m, La Moringa, Río Madera, 13.06.01
Prov. Jaén, WH3502, 1325m, Río Raigadas, 24.06.99
Prov. Jaén, WH3038, 980m, Orcera - Segura de la Sierra, 25.06.99
Prov. Jaén, WH3524, 950m, Arroyo Martín, Sa. de las Villas, 08.07.00
Prov. Jaén, WH34, 1700m, Siles, C.F. Acebeas, 06.70 (Nieschalk, 1971)
Prov. Jaén, WH3644, 1120m, Fuente de la Canálica, 25.06.99
Prov. Granada, VG60, 1600m, Bco. del río Monachil, 15.07.80 (Pérez Raya & Molero Mesa, 1990 as *E. atrorubens*). GDA11075 det. J. Benito Ayuso
Prov. Granada, WG13, Calar de Santa Bárbara (Pérez Raya & Molero Mesa, 1990 as *E. atrorubens*)
Prov. Granada, WG49, Sa. Sagra, Collado Capellanía, (Pérez Raya & Molero Mesa, 1990 as *E. atrorubens*). GDA11074 & 11076 det. J. Benito Ayuso
Prov. Granada, WG4097, 1350m, N Cortijo del Girón, Sa. Sagra, 24.06.99 (Lowe, 2000)
Prov. Granada, WH4202, 1250m, Las Santas, Sa. Sagra, 07.07.00 (Lowe, 2000)
Prov. Almería, WG43 29, 1350, Sa. Filabres, Serón-Las Menas, 25.06.91 (Peñas de Giles et al., 1998 as *E. atrorubens*)

Prov. Almería, WG4630, 1235m, Pinar de Bayarque, El Pinar, 06.07.00 (Lowe, 2000)
 Prov. Almería, WG4730, 1100m, Pinar de Bayarque, El Pinar, 06.07.00
 Prov. Almería, WG6771, 1300m, Los Alámicos, María (Pallarés Navarro, 1999)
 Prov. Almería, WG6771, 1225m, Los Alámicos, Sa. María, 06.07.00
 Prov. Almería, WG6970, 1550m, Los Gayubares, María (Pallarés Navarro, 1999)
 Prov. Almería, WG6970, 1550m, Los Gayubares, María (Pallarés Navarro, 1999 as *E. helleborine* var. *platyphylla*)
 Prov. Almería, WG7979, 1000m, Casa Forestal de El Gabar (Pallarés Navarro, 1999 as *E. helleborine* var. *platyphylla*)

Epipactis phyllanthos G. E. Sm.

Prov. Granada, VG51, Sa. Guéjar, 1889 (Molero Mesa. & Pérez Raya 1987 as *E. helleborine*)
 Prov. Granada, VG5413, 780m, Cenes Vega - Pinos Genil, 02.07.00 (Lowe, 2000)
 Prov. Granada, VG6409, 1360m, El Charcón - El Dornajo, 22.06.99 (Lowe, 2000)
 Prov. Granada, VG62, 1200m, Río Aguas Blancas, 22.07.80 (Pérez Raya & Molero Mesa, 1990 as *E. helleborine*). GDA11078 det. J. Benito Ayuso
 Prov. Granada, VG6721, 1260m, Río Aguas Blancas, 22.06.99 (Lowe, 2000)
 Prov. Granada, VG6920, 1320m, Río Aguas Blancas, 22.06.99 (Lowe, 2000)
 Prov. Almería, WF1393, 825m, Benacid, 27.06.99 (Lowe, 2000)

Epipactis tremolsii Pau

Prov. Sevilla, TG5396, 420m, El Pedroso, Sa. Norte, 02.05.00 (Lowe, 2000)
 Prov. Cádiz, TE5694, 40m, Punta Paloma, 27.03.99 (Lowe, 2000)
 Prov. Cádiz, TE7194, 380m, Sa. del Cabrito, El Cuartón, 07.05.01
 Prov. Cádiz, TF60, Sa. Saladavieja (Gil et al., 1985 as *E. helleborine*)
 Prov. Cádiz, TF60, Sa. de Niño, (Gil et al., 1985 as *E. helleborine*)
 Prov. Cádiz, TF6603, 9.6k ENE Facinas, 15.04.91 (Claessens, 1992)
 Prov. Cádiz, TF61, 260m, 10k NNW Los Barrios, 27.04.85 (Kreutz, 1989 as *E. helleborine*)
 Prov. Cádiz, TF70, Sa. de la Palma, (Gil et al., 1985 as *E. helleborine*)
 Prov. Cádiz, TF7865, NW Ubríque, (Valesco Ortega, 1988 as *E. helleborine*)
 Prov. Cádiz, TF8258, SSE Ubríque, (Valesco Ortega, 1988 as *E. helleborine*)
 Prov. Cádiz, TF8170, Sa. de Pinar, (Valesco Ortega, 1988 as *E. helleborine*)
 Prov. Cádiz, TF8372, Sa. de Pinar, (Valesco Ortega, 1988 as *E. helleborine*)
 Prov. Cádiz, TF8471, Sa. de Pinar, (Valesco Ortega, 1988 as *E. helleborine*)
 Prov. Cádiz, TF8571, Sa. de Pinar, (Valesco Ortega, 1988 as *E. helleborine*)
 Prov. Córdoba, TG9491, 225m, Embalse de Retorillo, 02.05.00 (Lowe, 2000)
 Prov. Córdoba, TG9897, 370m, Hornachuelos - San Calixto, 03.05.00 (Lowe, 2000)
 Prov. Córdoba, TH9700, 500m, Hornachuelos - San Calixto, 03.05.00 (Lowe, 2000)
 Prov. Córdoba, UG0193, 305m, Hornachuelos, Los Angeles, 03.05.00 (Lowe, 2000)
 Prov. Córdoba, UG83, Sa. de la Horconera, 14.06.81 (Muñoz Alvarez & Domínguez Vilches, 1985 as *E. atrorubens*)
 Prov. Córdoba, UH3410, 595m, Cerro del Valsequillo, 30.04.00 (Lowe, 2000)
 Prov. Córdoba, UH37, Sa. Santa Eufemia, north slopes, 24.06.86 (Jiménez & Ruíz de Clavijo as *E. helleborine*)
 Prov. Córdoba, UH40, 300-500m, Sa. Cordoba, NW Cordoba, 06.71 (Nieschalk, 1973 as *E. helleborine*)
 Prov. Córdoba, VG03, 800m, Sa. de Albayate, Las Navas (Muñoz Alvarez & Domínguez Vilches, 1985 as

E. helleborine)

- Prov. Málaga, TF7244, 320m, 4.6k NNW Las Canillas, 13.04.97 (Lowe, 1998)
Prov. Málaga, TF8448, 660m, 12.3k SE Peñón del Berruoco, 26.05.96 (Lowe, 1998)
Prov. Málaga, TF8456, 710m, 10.4k SW Cortes de la Frontera, 26.05.96 (Lowe, 1998)
Prov. Málaga, TF9636, 365m, NE Casares, 26.05.96 (Lowe, 1998)
Prov. Málaga, TF9835, 320m, 4k SSE Casares, 17.04.91 (Claessens, 1992)
Prov. Málaga, TF9949, 780m, Algatocín - Jubrique, 12.05.01
Prov. Málaga, TF9850, 560m, 2.5k E Algatocín, 03.04.88 (Hertel, 1989)
Prov. Málaga, UF03, 300m, NNW Estepona, 28.04.89 (Lowe, 1998)
Prov. Málaga, UF04, 480m, W Jubrique, 28.04.89 (Lowe, 1998)
Prov. Málaga, UF0341, 1120m, Cerro del Castellón, 12.05.01
Prov. Málaga, UF0342, 990m, Puerto de Peñas Blancas, 12.05.01
Prov. Málaga, UF0447, 780m, 3k SE Jubrique, 12.05.01
Prov. Málaga, UF05, 750m, N Faraján, 29.04.89 (Lowe, 1998)
Prov. Málaga, UF0655, 710m, Júzcar - Cartajima, 12.05.01
Prov. Málaga, UF0853, 835m, Pujerra - Jubrique, 24.05.96 (Lowe, 1998)
Prov. Málaga, UF15, 700m, Iguala - Pujerra, 29.04.89 (Lowe, 1998)
Prov. Málaga, UF16, 800m, Sa. de Ronda, 9k S Ronda, 12.04.83 (Tyteca, 1984 as *Epipactis* sp.)
Prov. Málaga, UF3249, 830m, 1k SE Refugio de Juanar, 08.04.89 (Ackermann, 1992)
Prov. Málaga, UF3150, 800m, 4.1k NW Ojén, 18.04.91 (Claessens, 1992)
Prov. Málaga, UF4140, 30m, Hotel Don Carlos - N340, 08.04.89 (Ackermann, 1992)
Prov. Málaga, UF4140, 20m, Elviria, N Las Chapas Hotel, 07.05.01
Prov. Málaga, UF4241, 20m, 11k E Marbella, 07.04.91 (Claessens, 1992)
Prov. Málaga, UF7875, 875m, 1.4k E Fuente de la Reina, 01.06.96 (Lowe, 1998)
Prov. Málaga, UF79, Cerro de la Cruz, (Nieschalk, 1971 as *E. helleborine*)
Prov. Jaén, VG2657, 1195m, SW Valdepeñas de Jaén, 27.04.99 (Lowe, 2000)
Prov. Jaén, VG57, Sa. Mágina (Bouillie et al., 1992 as *E. helleborine*)
Prov. Jaén, VH54, Despeñaperros (Bouillie et al, 1992 as *E. helleborine*)
Prov. Jaén, VH5749, 900m, Pto. de los Jardines, 28.04.99 (Lowe, 2000)
Prov. Jaén, VH6049, 1020m, Pto. de los Jardines, 28.04.99
Prov. Jaén, VH6150, 1080m, Mojón Blanco, 10.06.01
Prov. Jaén, WH2933, 1650m, Monte Yelmo Grande, 13.06.01
Prov. Granada, UG93, 700m, Priego - Algarinejos K145 (Muñoz Alvares & Domínguez Vilches, 1985 as *E. helleborine*)
Prov. Granada, VF37, N Otívar, (Stocken, 1969 as *E. helleborine*)
Prov. Granada, VF78, 1200m, Sa. de Mecina, 06.79 (Pérez Raya & Molero Mesa, 1990 as *E. helleborine*)

The distribution of each species is shown in figures 1 to 7.

The recording of *Epipactis* in southern Spain has presented many problems to local botanists, in part, as suggested by Tyteca (1995b) due to a lack of knowledge of *E. helleborine* s. str. in northern and central Europe, but also due to the variation in form of *E. tremolsii*, which can exhibit both pale and very dark colour forms. In determinations of *E. lusitanica*, the flower colour can also be misleading, as both pale and dark flowers occur, such that it is understandable that darkly coloured plants have been attributed to *E. atrorubens*. In Cádiz and Málaga mixed populations of both *E. lusitanica* and *E. tremolsii* occur, amongst which a range of intermediates are likely to be hybrids.

In reaching conclusions upon the identity of previous records, many locations have been revisited, but in others only a provisional conclusion can be reached, based upon the known distribution of the taxa and upon the habitats of the area. However, the possibility remains that some previous records considered here a *E. tremolsii* may fall to be determined as *E. cardina*, upon further research.

Acknowledgements

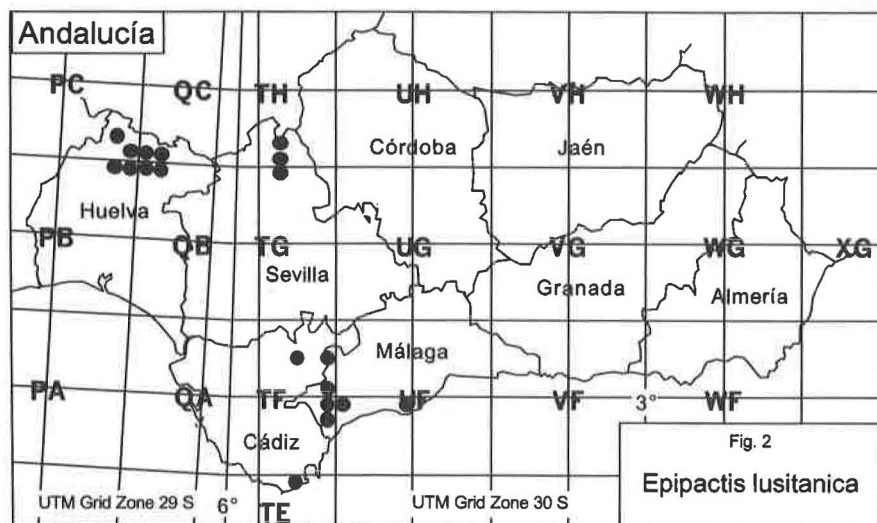
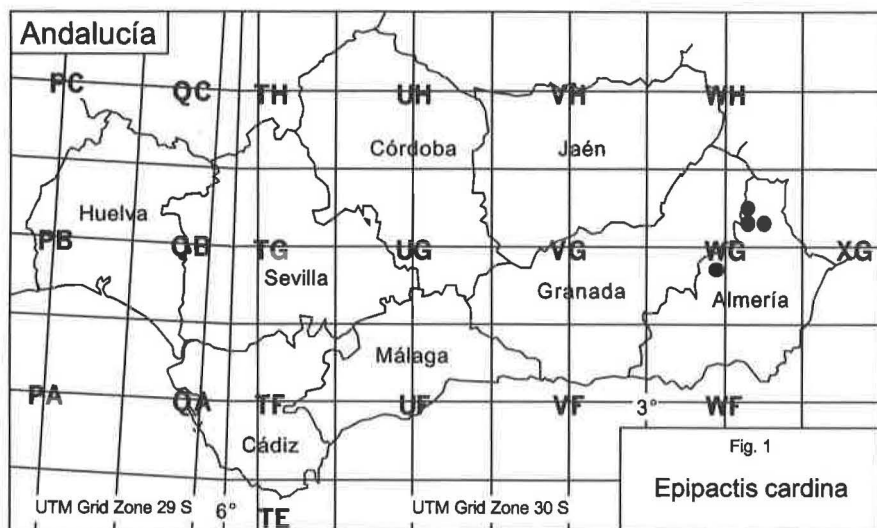
I am grateful to Javier Benito Ayuso for the determination of herbarium sheets from the University of Granada and for helpful comments in the field together with Carlos E. Hermosilla in the investigations of *Epipactis phyllanthos*. Also to Professor Ian Phillips for assistance in the field with the Cádiz and Málaga populations of *E. lusitanica* and to Daniel Tyteca for helpful discussions over several years.

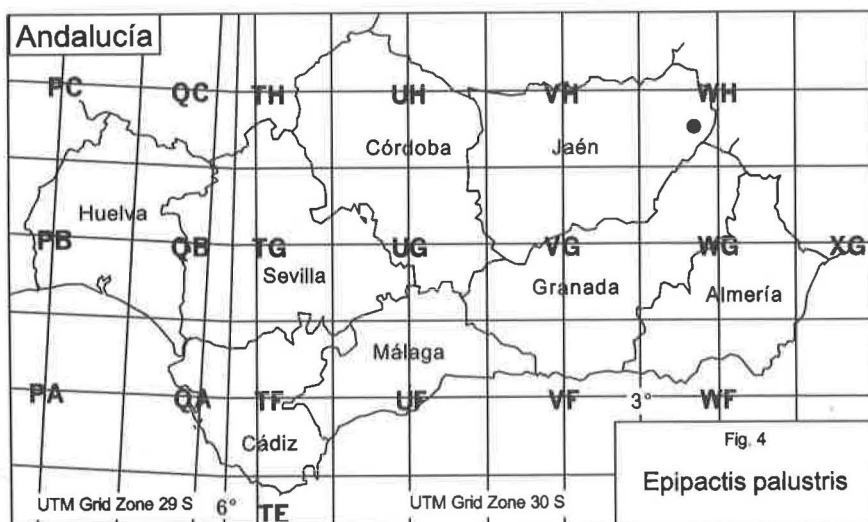
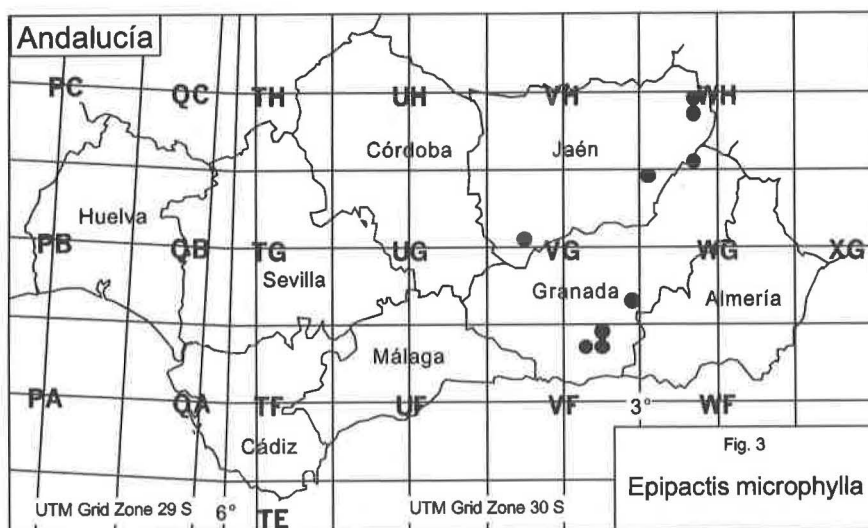
Bibliography

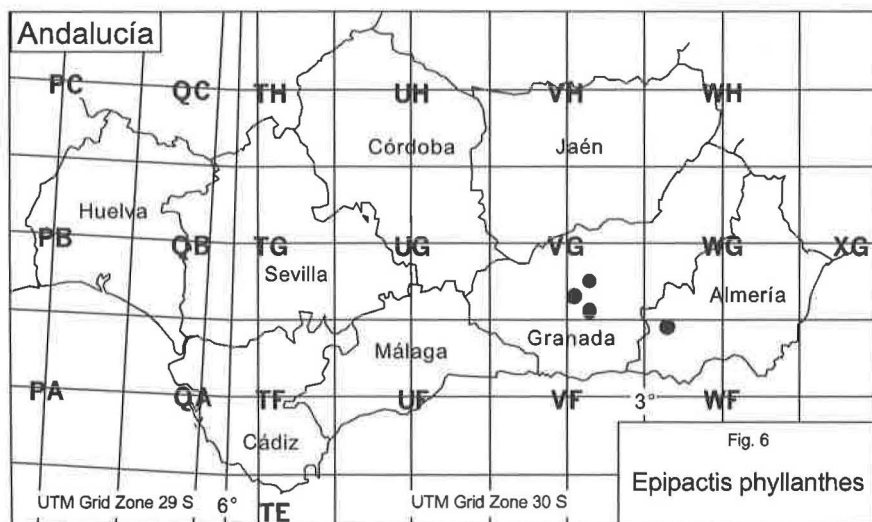
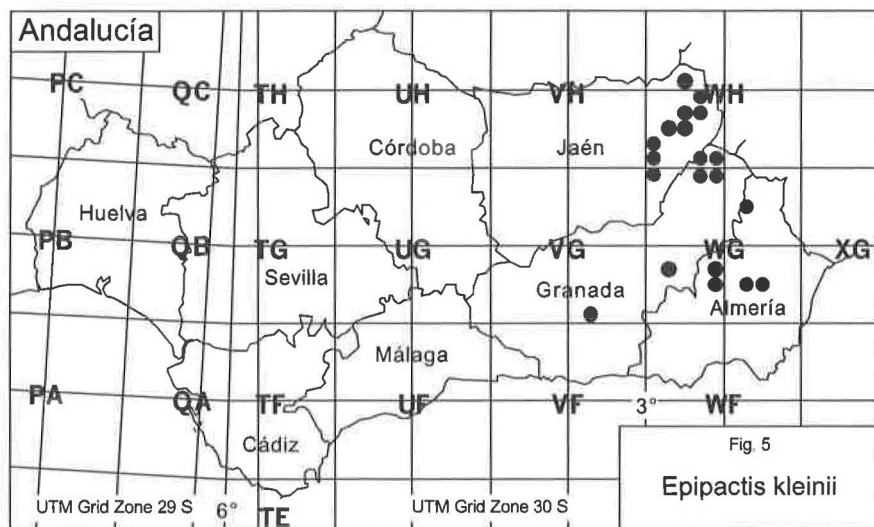
- Ackermann, M. & M. (1992): Einige Orchideenfunde aus Südsanien. Ber. Arbeitskr. Heim. Orch. 9(2): 64-69.
- Baumann, H & S. Künkele (1982): Die wildwachsenden Orchideen Europas, Stuttgart.
- Baumann, H & S. Künkele (1988): Die Orchideen Europas. Stuttgart.
- Benito Ayuso, J. & C. E. Hermosilla (1998): Dos nuevas especies ibéricas, *Epipactis cardina* y *Epipactis hispanica*, más alguno de sus híbridos: *Epipactis x conquensis* (*E. cardina* x *E. parviflora*), y *Epipactis x populetorum* (*E. helleborine* x *E. hispanica*). Est. Mus. Cienc. Nat. de Alava 13: 103-115.
- Bouillie, P., J. Bonilla-Quesada & C. Fernández-López (1992): Orquídeas de la provincia de Jaén. Blancoana 9: 102-109.
- Buttler, K.P. (1991): Field Guide to Orchids of Britain & Europe. Wiltshire.
- Charpin, A. & J. Fernández Casas (1975): Plantae per Granatense Regnum et confinia lectae. Candollea 30: 43-61.
- Claessens, J. (1992): Enige opmerkingen over de Orchideeën van Andalusië (Spanje). Eurorchis 4: 37-51.
- Claessens, J., J. Kleynen & J. Reinhardt (2000): Some notes on the genus *Epipactis*. Eurorchis 12: 75-83, 97.
- Crespo, M. B., M. R. Lowe & J. Piera (2001): *Epipactis kleinii*, a new name to replace the illegitimate *E. parviflora* (A. & C. Niesch.) E. Klein, non (Blume) A. A. Eaton (Orchidaceae, Neottieae). Taxon (in press).
- Davies, P., J. Davies & A. Huxley (1983): Wild Orchids of Britain & Europe. London.
- Delforge, P. (1994): Guide des Orchidées d'Europe d'Afrique du Nord et du Proche-Orient. Lausanne et Paris.
- Delforge, P. & D. Tyteca (1984): Guide des Orchidées d'Europe dans leur milieu naturel. Gembloux-Paris.
- Gil, J. M., J. Arroyo & J. A. Devisa (1985): Contribución al Conocimiento Florístico de las Sierras de Algeciras (Cádiz, España). Acta Botánica Malacitana 10: 97-122.
- Hertel, H. (1989): Beiträge zur Verbreitung der Orchideen in Andalusien. Ber. Arbeitskr. Heim. Orch. 6: 106-111.
- Jiménez, M. & E. Rufz de Clavijo (1990): 16. Nuevas areas para la flora de Andalucía Occidental. Lagasclia 16: 132-145.
- Klein, E. (1979): Revision der Spanischen *Epipactis*-Taxa *E. atrorubens* (Hoffm.) Schult. ssp. *parviflora* A. et C. Nieschalk, "*E. atrorubentii-microphylla*" und *E. tremolsii* C. Pau, Die Orchidee 30: 45-51.

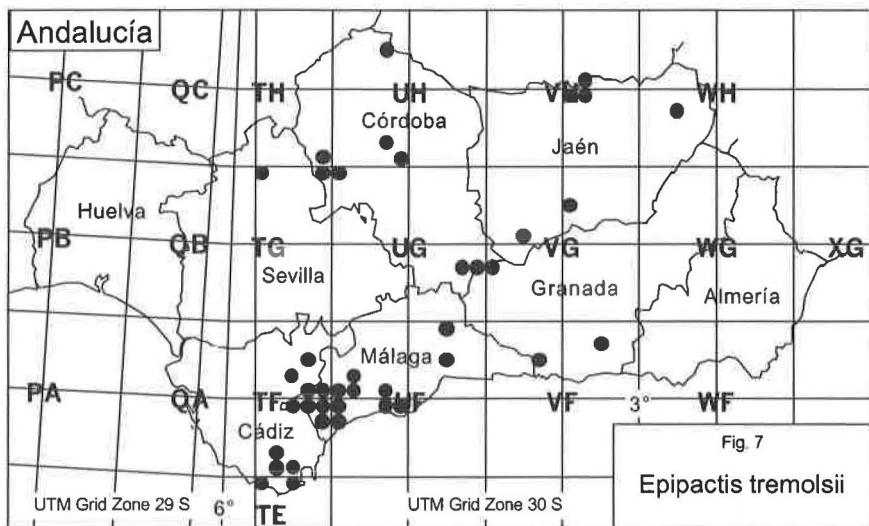
- Kreutz, C. A. J. (1989): Ergänzung zur Verbreitung einiger Orchideenarten auf der Iberischen Halbinsel, sowie Neubeschreibung von *Serapias gracilis*. Mitt. Bl. Arbeitskr. Heim. Orch. Baden-Württ. 21: 103-125.
- Lowe, M. R. (1998): The Orchids of the Province of Málaga, Spain. Jour. Eur. Orch. 30(3): 501-570.
- Lowe, M. R. (2000): Notes of orchids from Andalusia (Spain). Acta Botánica Malacitana 25: 243-247.
- Moore, D.M. in Tutin, T.G. et al. (1980): Flora Europaea 5. Cambridge.
- Muñoz Alvarez, J. M. & E. Dominguez Vilches (1985): Catalogo Floristico del sur de La Provincia de Cordoba. Cordoba.
- Nieschalk, A. & C. (1971): Ein Beitrag zur Kenntnis der Gattung *Epipactis* (Zinn) Sw. emend L. C. Rich. (Sektion *Epipactis*, Stendelwurz) in Spanien. Philippia 1/2: 57-64.
- Nieschalk, A. & C. (1973): Beiträge zur Orchideenflora Spaniens. Die Orchidee 24: 163-168 & 211-216.
- Pajaron-Sotomayor, S. (1989): Contribuciones a la flora vascular de Andalucía (España) y Del Rif (Marruecos) (1-5). Acta Botánica Malacitana 14: 273-277.
- Pallarés Navarro, A. (1999): Orquídeas de Almería. Gutenberg. Almería.
- Pau, C. (1914). Sobre algunos vegetales curiosos. Boletín de la Sociedad Argonesa de Ciencias Naturales Zaragoza 13: 42-43.
- Peñas de Giles, J., J. Mota Poveda, E. Dana Sánchez & J. Cabello Piñar (1998): Frangmenta Chorologica Occidentalia, 6590-6602. Anales Jard. Bot. Madrid 56: 140-141.
- Pérez Raya, F. & J. Molero Mesa (1990): Orquídeas silvestres de la Provincia de Granada, Granada.
- Rivera, J & B. Cabezudo (1985): Aportaciones al Conocimiento Floristico de la Sierra de Aracena (Huelva, España). Acta Botánica Malacitana 10: 61-78.
- Silvestre, S. (1983): Notes Taxonomiques y corologicas sobre la Flora de Andalucía Occidental, 295-300. Lagasalia 12: 133-135.
- Stocken, C. M. (1969): Andalusian flowers and countryside. Devon.
- Sundermann, H. (1980): Europäische und mediterrane Orchideen. Eine Bestimmungsflora. 3. Aufl., Hildesheim.
- Tyteca, D. & B. (1984): Orchidées observées en Espagne et au Portugal en 1982 et 1983. Bull. Soc. Roy. Bot. Belg. 117: 51-62.
- Tyteca, D. (1988): Orchidées du Portugal *Epipactis lusitanica* sp. nov. L'Orchidophile 19(84): 217-222.
- Tyteca, D. (1995a): New acquisitions in the taxonomy of allogamous species of the *Epipactis helleborine* (L.) Crantz group in western Europe. Jahresber. Nat. wiss. Ver. Wuppertal. 48: 154-175.
- Tyteca, D. (1995b): Multivariate analyses of western European allogamous populations of *Epipactis helleborine* (L.) Crantz s.l., with special emphasis on *E. tremolsii* Pau in southeastern France. Ber. Arbeitskrs. Heim. Orch. 12(1): 4-49.
- Tyteca, D. (1997): The Orchids Flora of Portugal. Jour. Eur. Orch. 29(2/3): 185-581.
- Tyteca, D. (1998): The Orchids Flora of Portugal - Addendum N. 1 - Remarks on the distribution of *Spiranthes aestivalis* (Poiret) L.C.M. Richard and three other species. Jour. Eur. Orch. 30(1): 230-245.
- Tyteca, D. & A. Caperta (1999): The Orchids Flora of Portugal - Addendum N. 2 - Chorological and systematic remarks on *Dactylorhiza maculata* (L.) Soó s.l. and *Epipactis helleborine* (L.) Crantz - First report of *E. phyllanthos* G.E. Sm. Jour. Eur. Orch. 31(2): 277-296.
- Tyteca, D. & M. Dufrêne (1994): Biostatistical studies of western European allogamous populations of the *Epipactis helleborine* (L.) Crantz species group (Orchidaceae). Systematic Botany 19(3): 424-442.
- Velasco Ortega, L. (1988): Orchideas del Parque Natural de la Sierra de Grazalema. Sevilla.

Michael R. Lowe
 School House
 17, The Village, Brancepeth
 Durham DH7 8DG, U.K.
 e-mail: MichaelRLowe@orchid.freeserve.co.uk









After sending the manuscript, the author became aware of additional records of *Epipactis cardina* in the following publication: Benito Ayuso, J. & J. M. Tabuenca Marraco (2000): Apuntes sobre orquídeas (Principalmente del Sistema Ibérico). Est. Mus. Cienc. Nat. de Alava 15: 103-126.

Prov. Jaén, WG08, 1900m, Sa. Cazorla, Pico Cabañas, 06.08.68

Prov. Granada, WH3813, 1600m, Sa. de Guillomo, Bco. de los Pastores, 28.07.68