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A new nothotaxon in the genus *Salix* L. *(Salicaceae)*

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Abstract: A new nothospecies is described in the genus *Salix* L. *(Salicaceae)* from the E. Spain: *S.* ×*atroelaeagnos* L. SERRA & M. B. CRESPO *(S. atrocinerea* × *S. elaeagnos)*. Morphological, ecological and chorological features of the new hybrid are reported, and a table showing diagnostic features of *S.* ×*atroelaeagnos* and its parental taxa, is also presented.

Keywords: *Salix, Salicaceae,* hybridization, Spain, Mediterranean region.

Introduction

During botanical field research carried out in the southeastern Iberian Peninsula, some individuals of a willow appearing to be morphologically intermediate between *Salix elaeagnos* SCOP. and *S. atrocinerea* BROT. were found living together with the former in Alicante Province. After collecting flowering female branches and comparison with typical material of both supposed parentals, we have stated their likely spontaneous hybrid origin.

Several recent monographs on the Iberian taxa of *Salix* L. are available (e.g. GÖRZ 1929, VICIOSO 1951, and BLANCO 1993), and no previous binomials seem to refer to this Alicantine nothotaxon. Moreover, other European and Northafrican floras (e.g. COSTE 1906, MAIRE 1961, QUÉZEL & SANTA 1962, PIGNATTI 1982, SILVESTRE 1987, BOLÓS & VIGO 1990, REICHINGER & AKEROYD 1993) do not mention any binomial for this hybrid.

Thus, in this contribution a new nothotaxon is described on the basis of female plant material collected near Benifallim (northern Alicante Province).

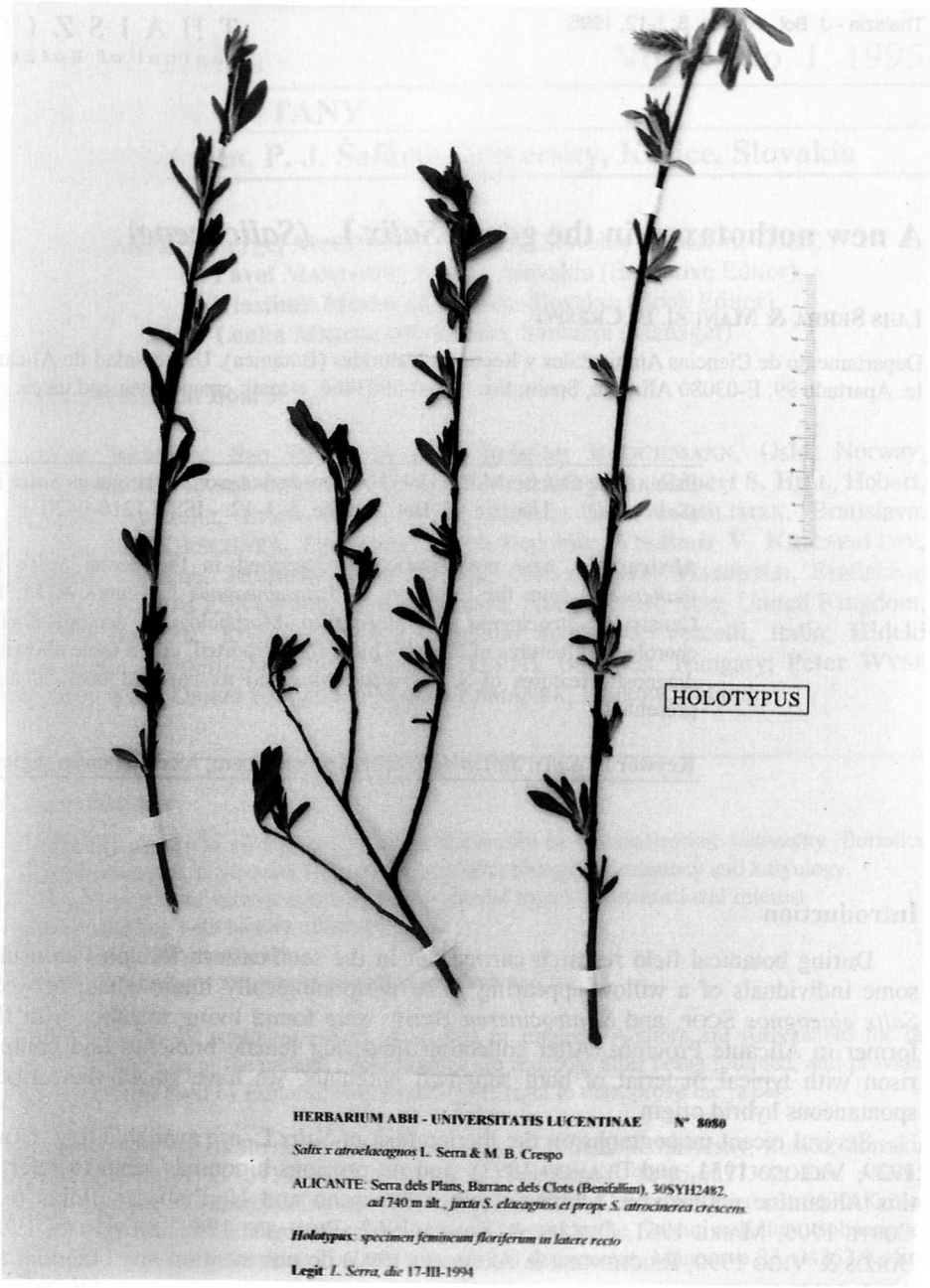


Fig. 1. - Holotype of *Salix* ×*atroelaeagnos* L. Serra & M.B. Crespo (ABH 8080), with flowering female catkins.

Material and methods

Observations were based on both living plants and dried specimens from ABH, VAB and VF (for abbreviations see HOLMGREN & al. 1990 and HOLMGREN & HOLMGREN 1993).

Both bioclimatic and biogeographic features are presented according to RIVAS-MARTÍNEZ (1987) and DE LA TORRE & al. (1995).

Phytosociological relevés were recorded by the traditional Sigmatist method (GÉHU & RIVAS-MARTÍNEZ 1981).

Results and discussion

Salix* ×*atroelaeagnos L. SERRA & M.B. CRESPO **nothosp. nov.** *(S. atrocinerea* BROT. × *S. elaeagnos* SCOP.)

A *S. atrocinerea* differt foliis angustioribus (ad 12 mm), subsessilibus vel breviter petiolatis (ad 4 mm); inflorescentiis generaliter brevioribus (ad 15 mm), pilis brevioribus obtectis (ad 0.6 mm); bracteis floralibus femineis saturate viridibus, ciliis marginalibus brevioribus (ad 1.5 mm); ovario glabro.

A *S. elaeagnos* discrepat foliis lanceolatis 3-4-plo longioribus quam latioribus, nervis lateralibus paucis (11-14 paribus), pagina inferiore laxe pilosa a basi pilis ferrugineis paucissimis vestita; inflorescentiis erectis vel erecto-patentibus, bracteis floralibus femineis ciliis marginalibus longioribus munitis; ovario supra pedunculo brevi 1 mm disposito.

Holotypus: Hs, Alicante: Barranc dels Clots (Benifallim), 30SYG2482, ad 740 m alt., juxta *S. elaeagnos* et prope *S. atrocinerea* crescens, ubi die 17-3-1994 cum flores femi-nei, legit L. Serra (ABH 8080, specimen femineum floriferum in latere recto). (Fig. 1)

Paratypi: Alicante: Benifallim, Barranc dels Clots, 30SYH2482, 740 m, 9-8-1992, L. Serra (ABH 8079) (Fig. 2). Ibidem, 5-3-1994, L. Serra (ABH 8081). Cocentaina, Río Serpis, pr. l'Alqueria d'Asnar, 30SYH29, 450 m, 30-10-1988, J. R. Nebot (VAB 89/3082). Tárbena, Barranc de Vinarreal, 30SYH5487, 280 m, 2-4-1994, L. Serra (ABH 8304).

Small shrub, branched from the base. Branchlets from last year pubescent, reddish-brown, grown-up branch sparsely pubescent. Buds glabrous. Leaves 4-6×0.8-1.2 cm, lanceolate or shortly linear-lanceolate, with acute apex and cuneate base, margin scarcely revolute, serrate, more densely toothed at the apex, with 11-14 pairs of secondary veins, raised beneath. Young leaves pubescent, with whitish trichomes on both sides; adult leaves sessile or with pubescent short petioles up to 2 mm, discoloured, nearly glabrous or very sparsely pilose above, white-tomentose with scattered ferrugineous trichomes below, chiefly at the base; stipules up to 2 mm, lanceolate, sometimes toothed, deciduous. Female catkins erect or erecto-patent, up to 15×5-6 mm, appearing together with or a little earlier than leaves, with pubescent peduncles. Floral bracts completely green, oval, apex obtuse, margin ciliate with trichomes up to 1.5 mm. Ovary glabrous, up to 4 mm length, with peduncle up to 1 mm and stigma bifid. Nectary solitary, ca. 1 mm long (Fig. 3).



Fig. 2. - Paratype of *Salix* ×*atroelaeagnos* L. Serra & M.B. Crespo (ABH 8079), showing features of adult leaves.

Tab. 1. Diagnostic morphological features among *S. atrocinerea*, *S. ×atroelaeagnos*, and *S. elaeagnos*.

	S. atrocinerea	*S. × atroelaeagnos*	*S. elaeagnos*
Leaves			
Length (cm)	4-10(-11.5)	4-6	4-8(-9)
Width (cm)	1.5-2.8(-4)	0.8-1.2	0.4-0.8(-1.2)
Shape	oblong to lanceolate	lanceolate to linear-lanceolate	linear to linear-lanceolate
Pairs of veins	8-14	11-14	16-22
Indumentum	leaves with white and ferrugineus trichomes beneath	leaves white-tomentose, with some small ferrugineus trichomes beneath	leaves white-tomentose beneath without ferrugineus trichomes
Inflorescence (cm)	4-7 x 1-2, with trichomes up to 2 mm	1.5 x 0.5-0.6, with trichomes up to 0.6 mm	1.5-2 (2.5) x 0.3-0.6(-0.8), with trichomes up to 0.6 mm
Bract of female flower			
Length (mm)	1.5-2	1.5-2	1.5-2.5(-3)
Colour	black in the apical half	entirely green	entirely green
Indumentum	pubescent throughout with trichomes 1.5-2 mm	border ciliate with trichomes 1.2-1.5 mm	border ciliate with trichomes 0.5-0.8 mm
Ovary			
Peduncle (mm)	2	1	0
Indumentum	pubescent	glabrous	glabrous
Length (mm)	5-7	3-4	(2.5-)3-4

The most important diagnostic features among the studied Iberolevantine (easten Spain) specimens of *S. atrocinerea, S. elaeagnos* and *S. ×atroelaeagnos* are shown in Tab. 1.

Biogeography and bioclimatology

S. ×atroelaeagnos has always been found together with its parents at only three locations in northern Alicante Province (Fig. 4), in the so-called Alcoiano-Dianic chorological subsector (DE LA TORRE, ALCARAZ & CRESPO 1995), which belongs to the Setabensian sector of the Catalonian-Valencian-Provencian chrological province (RIVAS-MARTÍNEZ 1987). Nevertheless, the potential ditribution area of this nothotaxon could extend to most of the Iberian Peninsula, Northern Africa, Southern France, Italy and also the Balkan Peninsula, territories in which both parents are said to live together (BLANCO 1993, RECHINGER & AKEROYD 1993).

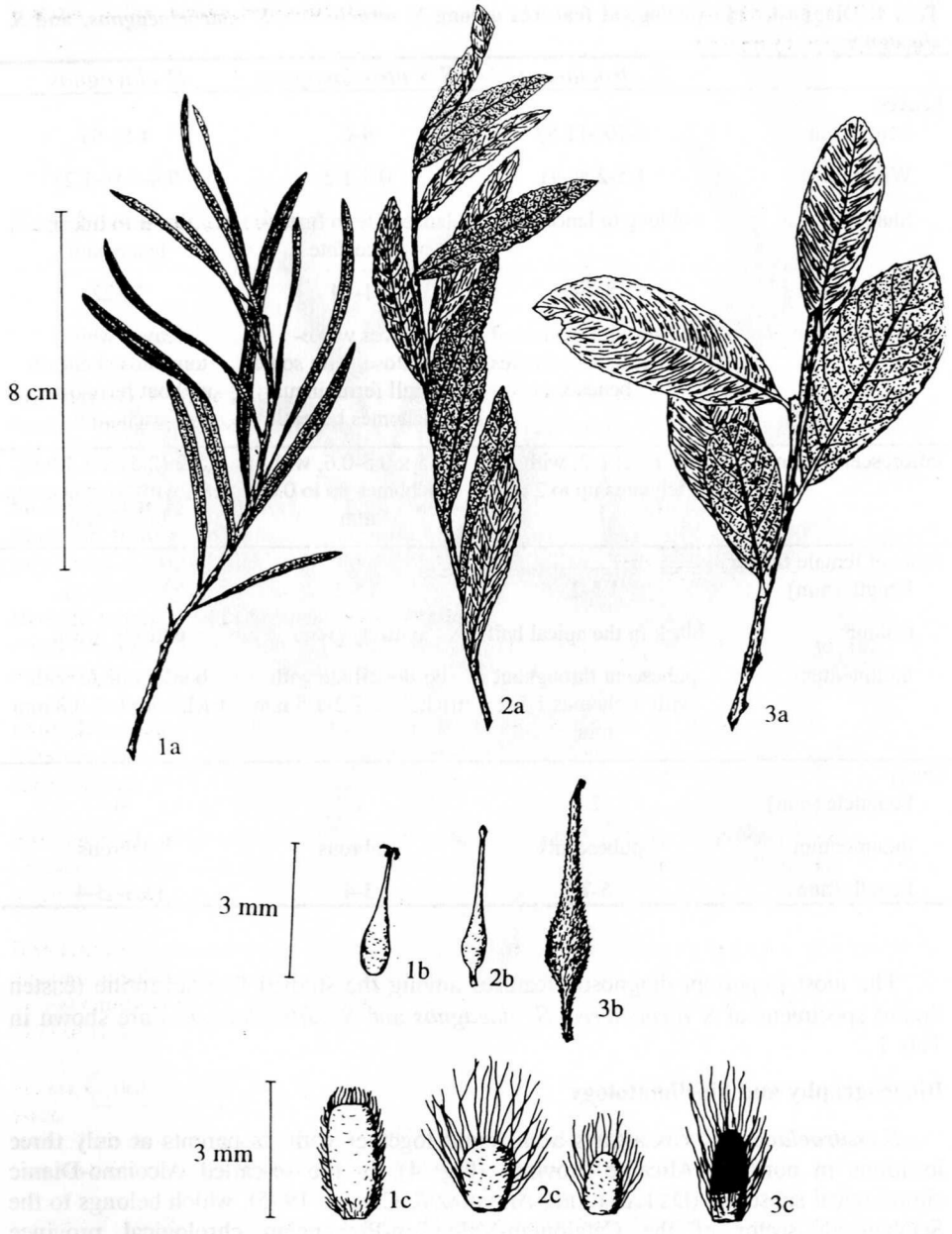


Fig. 3. - *Salix elaeagnos* (Barranc dels Clots, Benifallim): 1a, branch with leaves; 1b, ovary; 1c, bract of female flower. *Salix* ×*atroelaeagnos* (Barranc dels Clots, Benifallim): 2a, branch with leaves; 2b, ovary; 2c, bract of female flower. *Salix atrocinerea* (Serra de Cantacuc, Balones): 3a, branch with leaves; 3b, ovary; 3c, bract of female flower.

Bioclimatically, this new hybrid was always observed in both the mesomediterranean and the thermomediterranean belts, and under both subhumid and dry ombroclimates (RIVAS-MARTÍNEZ 1987).

Ecology and phytosociology

S. ×*atroelaeagnos* shows a characteristic ecological behaviour (Tab. 2) which appears to be almost intermediate between those of its parents. On one hand, it grows in willow-groves belonging to the association *Salicetum triandro-eleagni* RIVAS-MARTÍNEZ ex G. LÓPEZ 1976 (All. *Salicion triandro-neotrichae* BR.-BL. & O. BOLÓS 1957, Ord. *Salicetalia purpureae* MOOR 1958, Class. *Querco-Fagetea* BR.-BL. & VLIEGER in VLIEGER 1937), which live in gravelly soils of seasonal torrents. These plant formations commonly are in contact with groves of *Salix atrocinerea,* in which plants of thorny forest vegetation (Ord. *Prunetalia spinosae* R. TX. 1952) are rather abundant.

On the other hand, it also grows in perennial herb vegetation related to both Class. *Artemisietea vulgaris* LOHM., PREIS. & R. TX. 1950 em. LOHM. & al. 1962 and *Molinio-Arrhenatheretea* R. TX. 1937, living on clayish soils close to seasonal streams.

Although dense willow-groves of many Iberolevantine territories were systematically sampled to find new populations of *S.* ×*atroelaeagnos,* the hybrid was always found in locations in which both parental taxa were locally rather rare.

New investigations are still needed to complete the knowledge of the distribution of *S.* ×*atroelaeagnos.*

Studied materials

Salix elaeagnos SCOP., Fl. Carniol. ed. 2, 2:257, 1772

= *S. angustifolia* POIR., Nouv. Duham. Trait. Arbr. ed 2. III. 128 (1806), non WILLD.
= *S. elaeagnos* var. *angustifolia* (POIR.) C. VICIOSO in Bol. Inst. Forest. Invest. Exp. 57:79 (1951)
= *S. elaeagnos* subsp. *angustifolia* (CARIOT) RECH. fil. in Oesterr. Bot. Z. 104:314 (1957)

Hs, Alicante: Relleu, Río de La Vila, 30SYH 3077, 600 m, 15-4-1989, L. Serra (ABH-LS 119). Alcoi, Els Canalons, 30SYH 18, 700 m, 28-9-1986, J.R. Nebot. (VAB 86/2074). Riu d'Agres, 22-3-1987, J.R. Nebot (VAB 87/0104). L'Orxa, márgenes del río Serpis, 200 m, 5-4-1985, G. Mateo, M.B. Crespo & J. R. Nebot (VAB 85/1698). Benifallim, Serra dels Plans, Barranc dels Clots, 30SYH 2482, 740 m, 5-3-1994, L. Serra (ABH 8039). Confrides, pr. del pueblo, 30SYH 3885, 740 m, 6-3-1994, L. Serra (ABH 8051). Alqueria d'Asnar, Riu Serpis, 30SYH 2394, 360 m, 1-4 1994, L. Serra (ABH 8308). Planes, Barranc de l'Encantada, 30SYH3296, 480 m, 2-4-1994, L. Serra (ABH 8305). Vall d'Ebo, Barranc de Sergues, 30SYH4699, 380 m, 2-4-1994, L. Serra (ABH 8309).

Hs, Castellón: Bejís, estret del Coll de Cascajar, 30SXK9123, 940 m, 18-5-1992, G. Mateo, L. Serra & J.X. Soler (ABH-LS 2750). Fuente la Reina, 30TYK03, 800 m, 21-5-1986, G. Mateo & R. Figuerola (VAB 86/0466). Alrededores de Vila-Real, 30TYK42, 1-5-1985, F. Valverde (VAB 85/3320). Vistabella del Maestrat, Penyagolosa, Mas de Mor, sobre l'Esquilador, 12.8.1959, M. Calduch (VF 3398). Vistabella del Maestrat, Barranco del Forcall, 30TYK3465, 700 m, 26-4-1986, C. Fabregat (VAB 88/4438). Castillo de Villamalefa, 15-12-1985, A. Nebot (VAB

88/4764). Fuentes de Ayódar, 30TYK23, 60 m, 23-3-1986, G. Mateo (VAB 83(0092). Vistabella del Maestrat, pr. Mas del Pont, 30TYK2567, 1000 m, 25-5-1986, C. Fabregat & Catania (VAB 88/4437). Montanejos, 30TYK13, 500 m, G. Mateo (VAB 85/1540).

Hs, Cuenca: Talayuelas, 900 m, 5-1979, G. Mateo (VAB 79/0201), Boniches, 30TXK12, 1100 m, 4-6-1985, G. Mateo (VAB 85/1696).

Hs, Granada: Barranco de Huenes, pr. Puente de los Siete Ojos, 30SVG50, 1200 m, 5-5-1981, Raya, Molero & Casares (VAB).

Hs, León: Palacios del Sil, 29TQH05, 2-7-1983, E. Puente (VF 17524).

Hs, Soria: Burgo de Osma, Márgenes del río Avión, 900 m, 24-7-1984, G. Mateo (VAB 84/1123). Montenegro de Cameros, 1500 m, 8-1981, A. Segura & G. Mateo (VAB 81/0251). Berlanga de Duero, 900 m, 27-4-1984, G. Mateo (VAB 84/1124).

Hs, Teruel: Royuela, río Guadalaviar, 30TXK2672, 1200 m, 28-5-1989, P. Donat (VAB 90/0286). Olba, Los Pertegaces, 30TYK0044, 600 m, 20-4-1991, G. Mateo (VAB 91/1063). Alcalá de la Selva, 1500 m, 18-6-1983, G. Mateo & A. Aguilella (VAB 83/0511). Ladruñan, Hoces del Guadalope, 30TYL10, 800 m, 4-5-1985, A. Aguilella (VAB). Cantavieja, Barranco del Ojal, 30TYK1790, 1250 m, 4-9-1993, C. Fabregat & S. López (VAB 93/3696).

Hs, Valencia: Alfara de Algimia, Rambla de Somat, 30SYK2305, 200 m, 6-1986, M.B. Crespo (ABH 3618). Bocairent, Serra de Mariola, Font de Mariola, 30SYH19, 900 m, 15-9-1986, L. Serra (ABH-LS 2101). Sot de Chera, márgenes del arroyo Reatillo, 400 m, 16-5-1984, G. Mateo & R. Figuerola (VAB 84/1125). Siete Aguas, 700 m, 2-10-1983, G. Mateo (VAB 83/0510). Sinarcas, márgenes del Regajo, 700 m, 5-1977, G. Mateo (VAB 770161). Moixent, 400 m, 4-1979, G. Mateo (VAB). Embalse de Buseo, 30SXJ78, 3-1986, E. Sanchis, J.A. Alcober & A. Aguilella (VAB 86/2222). Montes de Calles a Higueruelas, 5-1987, M. Murgui, B. Redondo & S. Lluch (VAB 87/0751). Siete Aguas, 700 m, 18-4-1984, G. Mateo (VAB 84/1238). Rambla de Algimia, 6-5-1989, E. Estrelles (VF 15553). Gestalgar, río Turia, 6-1983, G. Mateo & R. Figuerola (VF 11060). Jarafuel, Fuente del Tobarro, 7-4-1980, J.B. Peris (VF 9175).

Salix atrocinerea BROT., Fl. Lusit. 1:31, 1804

= *S. catalaunica* SENNEN, in sched. ad Pl. d'Esp., 1920 n. 4040 (fol. nondum maturis), 5425 (fr., fol.)
= *S. atrocinerea* subsp. *catalaunica* (SENNEN) GÖRZ in Cavanillesia 2:142 (1929)
= *S. atrocinerea* var. *catalaunica* (SENNEN) C. VICIOSO in Bol. Inst. Forest. Invest. Exp. 57:116 (1951)

Hs, Alicante: Altea, desembocadura del río Algar, 30SYH5678, 20 m, 17-6-1992, J.L. Solanas (ABH 5427). Gaianes, Serra del Benicadell, 30SYJ20, 27-4-1986, J.R. Nebot (VAB 90/0675). Alcoi, Riu Barxell, 30SYH18, 750 m, 14-2-1988, J.R. Nebot (VAB 89/3081). Cocentaina, Riu Serpis, pr. Alqueria d'Asnar, 30SYH29, 30-10-1988, J.R. Nebot (VAB 89/3082). Benifallim, Els Horts, 30SYH2582, 825 m, 12-6-1990, L. Serra (VAB 93/1962). Formentera del Segura, pr. del pueblo, 30SXH9717, 10 m, 22-2-1994, L. Serra (ABH 8031). Callosa d'Ensarriá, Nacimiento del río Algar, 30SYH5283, 160 m, 6-3-1994, L. Serra (ABH 8053). Confrides, pr. del pueblo, 30SYH3885, 740 m, 6-3-1994, L. Serra (ABH 8052). Alqueria d'Asnar, Riu Serpis, 30SYH2394, 360 m, 1-4-1994, L. Serra (ABH 8307). Planes, Barranc de l'Encantada, 30SYH3296, 480 m, 2-4-1994, L. Serra (ABH 8306). Vall d'Ebo, Barranc de Sergues, 30SYH4699, 380 m, 2-4-1994, L. Serra (ABH 8310). Tárbena, Barranc de Vinarreal, 30SYH5487, 280 m, 2-4-1994, L. Serra (ABH 8303).

Hs, Burgos: Carazo, valle próximo al pueblo, 30TVM7047, 1120 m, 11-7-1989, M.L. Gil Zóniga & J.A. Alejandre (VAB 91/3394).

Hs, Cádiz: Alcalá de los Gazules, Sierra del Algibe, El Picacho, 4-1993, M.B. Crespo, A. de la Torre & J.C. Cristóbal (ABH 5648).

Hs, Castellón: Zorita del Maestrazgo, río Bergantes, 30TYL4019, 600 m, 5-6-1987, M.B. Crespo (ABH 2970). Altura, Barranco de la Torrecilla, 30TYK11, 350 m, 2-7-1986, M.B. Crespo (VAB 86/0698). Benafigos, Barranco de la Ortisella, 30TYK36, 750 m, 8-8-1987, C. Fabregat (VAB 88/4435). Villahermosa del Rio, 30TYK25, 700 m, 29-3-1987, A. Nebot (VAB 88/5384). Vistabella del Maestrat, entre el Mas de la Cambra y el río Monleón, 30TYK2768, 1100 m, 14-6-1987, C. Fabregat (VAB 88/4436). Vistabella del Maestrat, Barranc de Sant Joan de Penyagolosa, 2-11-1958, M. Calduch (VF 4109). Cedramán, 27-10-1986, A. Nebot (VAB 88/4775). Puebla de Arenoso, 10-9-1985, J.J. Herrero-Borgoñón (VAB.). Vila-Real, 30TYK 42, 5-4-1986, F. Valverde (VAB 88/0628). La Puebla de Arenoso, hacia Olba, 30TYK04, 650 m, 8-6-1985, G. Mateo (VAB 85/1644). Montanejos, 30TYK13, 500 m, 8-6-1985, G. Mateo (VAB 85/1553). Vallibona, 650 m, 2.7.1983, G. Mateo & A. Aguilella (VAB 83/0508). Chóvar, 400 m, 6-1984, G. Mateo (VAB 84/1119). Borriana, río Mijares, 30SYK5421, 4 m, M. Guerola (VAB 92/3210).

Hs, Cuenca: Mira, 4-1979, 900 m, G. Mateo (VAB 79/0199). Garaballa, Los Chicoteros, 4-1979, 1150 m, G. Mateo (VAB 79/0200). Talayuelas, 5-1977, 1000 m, G. Mateo (VAB 77/0160).

Hs, Granada: Ventas de Zafarraya, La Alcaicería, arroyo de los Nacimientos, 30VF0790, 1-6-1990, 1000 m, S. Silvestre (VAB 92/0480). Pantano de los Bermejales, río Grande, 30SVF2095, 840 m, 31-3-1990, Garcia & Silvestre (VAB 92/0478). Dúrcal, río Dúrcal, El Puente, 30VF4996, 750 m, 16-3-1990, Rowe & Silvestre (VAB 92/0477). Loja, Los Infiernos, río Genil, 30SUG9914, 430 m, 1-6-1990, S. Silvestre (VAB 92/0476).

Hs, Jaén: Aldeaquemada, río Guarrizas, 720 m, 30SVH6651, 18-4-1990, S. Silvestre (VAB 92/0475).

Hs, Palencia: Cardano de Abajo, 30TUN55, 10-9-1985, 1700 m, F. Llamas (VAB 91/0095).

Hs, Sevilla: Lora del Río, arroyo de la Lanticosa, 23-3-1990, S. Silvestre (VAB 92/0481).

Hs, Soria: Olvega, alto del Puerto de Carrasca, 30TWM82, 1180 m, 9-5-1993, G. Mateo (VAB 93/0511).

Hs, Teruel: Mosqueruela, entre el río Monleón y el Mas de las Calzadas, 30TYK26, 1100 m, 2.8.1987, C. Fabregat (VAB 88/4434). Cantavieja, Barranco del Ojal, 30TYK1790, 1250 m, 4-9-1993, C. Fabregat & S. López (VAB 93/3693). Ladruñan, Hoces del Guadalope, 30TYL10, 800 m, 4-5-1985, A. Aguilella (VAB). Olba, Los Pertegaces, 30TYK0044, 600 m, 20-4-1991, G. Mateo (VAB 91/1062).

Hs, Valencia: Bocairent, Sierra de Mariola, nacimiento del Vinalopó, 30SYH08, 800 m, 22-10-1988, J.L. Solanas (ABH 3059). Castielfabib, 30SXK4444, 880 m, 24-4-1988, G. Mateo (VAB 88/0542). Siete Aguas, 700 m, 2-10-1983, G. Mateo (VAB 83/0507). Castellar, río Turia, 4-11-1984, G. Mateo (VAB 84/1121). Cortes de Pallás, 400 m, 4-4-1984, G. Mateo & R. Figuerola (VAB 84/1122).

Hs, Vizcaya: Arronategui, Puerto de Solluibe, 30TWP1906, 400 m, 23-4-1991, J.L. Moya (VAB 91/3476).

Table 2. Ass. *Salicetum discolori-angustifoliae* RIVAS MART. *ex* G. LÓPEZ 1976 *corr.* ALCARAZ & al. 1991.

No. of relevé	1	2	3	4	5	6	7
Altitude (m)	360	740	480	480	380	280	740
Area (m^2)	30	8	60	70	40	50	150
Exposure	-	5NE	-	-	5E	5S	10N
Cover (%)	100	50	70	100	90	100	100
No. species	10	4	6	10	10	18	7
Date (month/year)	3/94	3/94	4/94	4/94	4/94	4/94	3/94
*Salix elaeagnos**	3.3	1.2	3.3	2.2	3.3	(+)	4.4
Salix atrocinerea	2.2	.	2.2	3.3	+	(+)	1.2
Salix × *atroelaeagnos*	.	1.2	.	.	.	1.2	.
Characteristic of higher syntaxa:							
Rubus ulmifolius	2.2	1.2	.	3.3	2.2	3.3	3.3
Rosa sempervirens	.	.	.	.	1.2	1.2	.
Populus nigra	.	.	1.2	1.2	.	.	.
Rosa pouzinii	.	.	.	2.2	.	.	.
Accompanying:							
Potentilla reptans	1.2	.	.	1.2	1.2	1.2	.
Scirpus holoschoenus	1.2	+	1.2	.	1.2	+	.
Arundo donax	1.2	.	.	1.2	+	1.2	.
Nerium oleander	.	.	.	+	+	1.2	.
Galium aparine	1.2	.	.	1.2	.	.	.
Dittrichia viscosa	.	.	1.2	.	.	.	1.2
Equisetum ramosissimum	1.2	.	.	.	.	+	.
Mentha suaveolens	.	.	.	+	.	+	+
Plantago lanceolata	.	.	1.2	.	.	+	.
Festuca arundinacea subsp. *fenas*	.	.	.	.	1.2	+	.
Cytisus heterochrous	.	.	.	.	.	+	+
Dorycnium rectum	.	.	.	.	.	3.3	.
Arum italicum	.	.	.	.	.	1.2	.
Artemisia verlotiorum	1.2	.	.	.	.	.	.
Sambucus ebulus	1.2	.	.	.	.	.	.
Tamus communis	.	.	.	.	.	1.2	.
Euphorbia hirsuta	.	.	.	.	.	+	.
Hedera helix	.	.	.	.	.	.	+
Ranunculus bulbosus subsp. *aleae*	.	.	.	.	+	.	.

*Authors of taxa after MATEO & CRESPO (1990).

Localities of relevés (all from Alicante Province, eastern Spain): 1. Riu Serpis (Alqueria d'Asnar), 30SYH2394; 2. Barranc dels Clots (Benifallim), 30SYH2482; 3, 4 Barranc de l'Encantada (Planes), 30SYH3296; 5. Barranc de Sergues (Vall d'Ebo), 30SYH4699; 6. Barranc de Vinarreal (Tarbena), 30SYH5487; 7. Barranc pr. Confrides (Confrides), 30SYH3885.

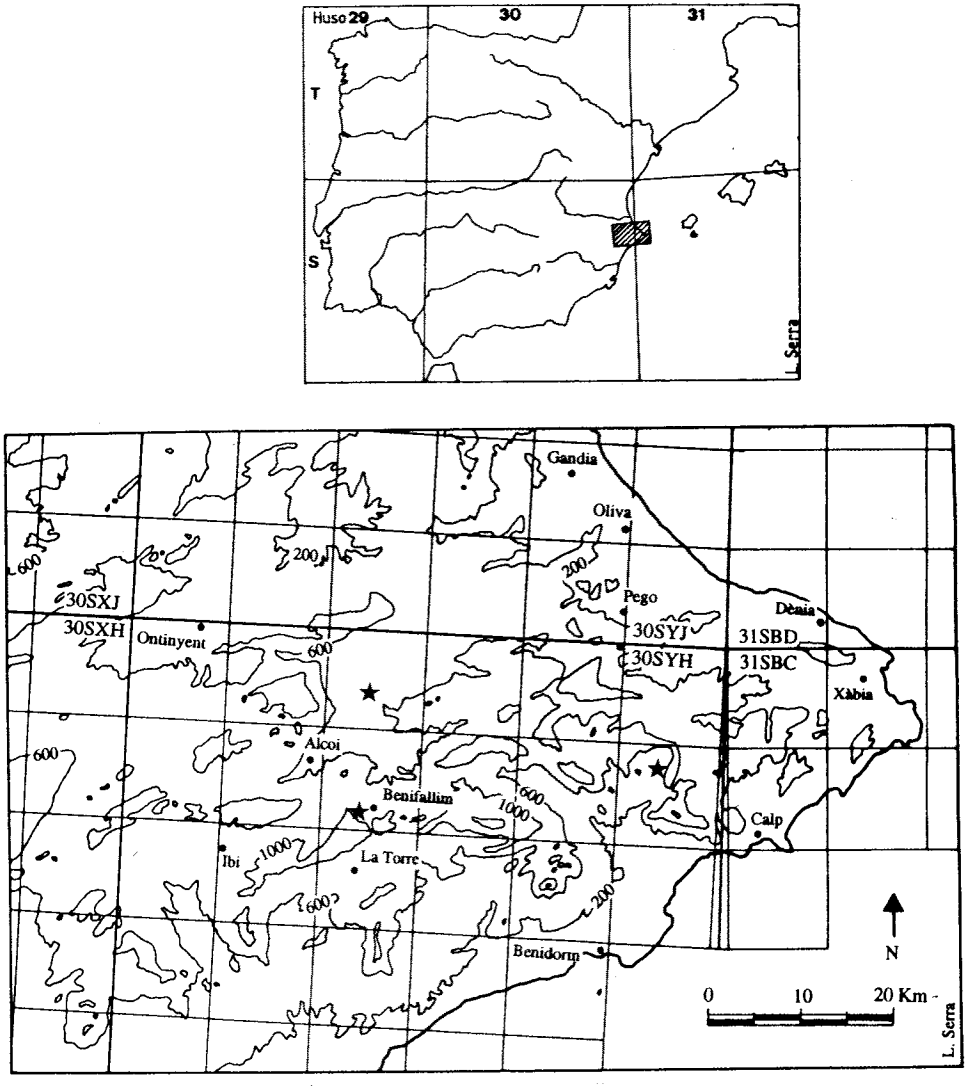


Fig. 4. - Studied localities of *Salix* ×*atroelaeagnos* L. Serra & M.B. Crespo.

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References

BLANCO P. (1993): Salix. In: CASTROVIEJO & al. (eds.). Flora iberica, III. Plumbaginaceae (partim)-Capparaceae, p. 477-517. - Madrid.

BOLÓS O. DE & VIGO J. (1990): Flora dels Paisos Catalans, II. Crucíferes-Amarantácies. - Barcelona.

COSTE H. (1906): Flore descriptive et illustrée de la France, de la Corse et des contrées limitrophes, 3. -Paris.

DE LA TORRE A., ALCARAZ F. & CRESPO M. B. (1995): Aproximación a la biogeografía del sector Setabense (provincia Catalano-Valenciano-Provenzal). - Rivasgodaya 8 (in press).

GÉHU J. M. & RIVAS-MARTÍNEZ S. (1981): Notions fondamentales de Phytosociologie. In: DIERSCHKE S. (ed.): Syntaxonomie, p. 5-53. - Vaduz.

GÖRZ R. (1929): Les saules de Catalogne. - Cavanillesia 2:97-158.

HOLMGREN P. K., HOLMGREN N. H. & BARNETT L. C. (1990): Index Herbariorum. Part I. The Herbaria of the world. Ed. 8. Regnum Veg. 120.

HOLMGREN P.K. & HOLMGREN N.H. (1993): Additions to Index Herbariorum (Herbaria), edition 8 - Second Series. - Taxon 42: 489-505.

MAIRE R. (1961): Flore de l'Afrique du Nord, 7. - Paris.

MATEO G. & CRESPO M. B. (1990): Claves para la flora valenciana. - Valencia.

PIGNATTI S. (1982): Flora d'Italia, 2. - Bolonia.

QUÉZEL P. & SANTA S. (1962): Nouvelle Flore de l'Algérie, 1. - Paris.

RECHINGER K. H. & AKEROYD J. R. (1993): Salix. In: TUTIN & al. (eds.): Flora Europaea, vol I. Psilotaceae - Platanaceae, p. 53-64. - Cambridge.

RIVAS-MATRÍNEZ S. (1987): Memoria del mapa de series de vegetación de España 1: 400.000. Madrid.

SILVESTRE S. (1987): Salix. In: VALDÉS, TALAVERA & FERNÁNDEZ-GALIANO (eds.): Flora de Andalucía Occidental, 1, p. 367-371. - Barcelona.

VICIOSO C. (1951): Salicáceas de España. - Bol. Inst. Forest. Invest. Exp. 57:1-131.

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