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Supplementary material

Appendix S1. Location of the studied populations in the *Santolina rosmarinifolia* aggregate. All plants were collected by the first author; they are deposited in the herbarium of Seville University (SEV) and in the personal herbarium of the author.

Santolina impressa: **Portugal**: **Setúbal**: Comporta, 38°22'46"N 8°46'28"W, 14 m, gravel, sand, clay, and mud, (SEV 242707); Montevil, 38°23'55"N 8°36'54"W, 13 m, gravel, sand, clay, and mud, (SEV 249065); Batalha, 38°23'42"N 8°34'35"W, 19 m, gravel, sand, clay, and mud, (SEV 242706); Troia Peninsula, 38°26'08"N 8°49'51"W, 8 m, gravel, sand, clay, and mud, (SEV 242708); Torre, 38°20'35"N 8°46'27"W 24 m, gravel, sand, clay, and mud, (SEV 242709); Sines, 38°00'05"N 8°49'46"W, 34 m, gravel, sand, clay, and mud, (SEV 249066). ***Santolina rosmarinifolia* subsp. *arrabidensis***: **Portugal**: **Setúbal**: Vila Nogueira de Azeitão, 38°29'55"N 9°01'03"W, 145 m, marl-limestone, (SEV 249067); Sierra de Arrábida, in front of tile factory, 38°29'33"N 8°59'47"W, 160 m, sandstone and limestone conglomerate, (SEV 217475). ***Santolina ageratifolia***: **Spain**: **Teruel**: Ródenas, 40º38'87"N 1º31'12"W, 1,400 m, conglomerates, sandstone and red limolite, (SEV 249068); Cerro San Ginés, 40º38'06"N 1º29'19"W, 1,430 m, quartzite, (SEV 249069). ***Santolina melidensis***: **Spain**: **La Coruña**: Santiso, area of Barazón, 42º52'49"N 8º04'24"W, 410 m, serpentines, (SEV 249070). ***Santolina orocarpetana***: **Spain**: **Ávila**: La Mira, 40º15'59"N 5º10'28"W, 2,200 m, granites, (SEV 249071); Canchal Negro, 40º20'88"N 5º40'27"W, 2,000 m, granites, (SEV 249072). **Salamanca**: Béjar, La Garganta, 40º19'48"N 5º49'10"W, 1,000 m, granites, (SEV 249073); El Calvitero, 40º17'16"N 5º44'18"W, 2,360 m, granites, (SEV 249074). ***S. rosmarinifolia* subsp. *rosmarinifolia***: **Spain**: **Álava**: Lantaron, Fontecha, 42°44'30"N 30°01'04"W, 464 m, conglomerates and limestone, (SEV 249075); Moreda de Álava, 42º31'19"N 2º24'38"W, 463 m, conglomerates and limestone, (SEV 249076); Nograro 42º49'59"N 3º06'16"W, 671 m, basalt, (SEV 249077); Bóveda, 42º37'78"N 7º29'03"W, 369 m, marl-limestone, marl, clay, and limestone, (SEV 249078). **Ávila**: Adanero, 40°53'32"N

4°37'17"W, 920 m, granites, (SEV 249079); Pozanco, 40º48'94"N 4º40'55"W, 890 m, granites, (SEV 249080); Ojos Albos, 40º43'76"N 4º31'42"W, 1,158 m, granites, (SEV 249081); Barco de Ávila, 40°21'25"N 5°32'02"W, 1,020 m, granites, (SEV 249082); Sanchicorto, 40º37'38"N 4º57'88"W, 1,351 m, granites, (SEV 249083); Gotarrendura, 40º49'73"N 4º44'96"W, 937 m, granites, (SEV 249084); Hoyocasero, 40°21'54"N 4°11'49"W, 1,300 m, granites, (SEV 249085); Hoyos del Collado, 40°22'17"N 5°14'9"W, 1,530 m, granites, (SEV 249086). **Burgos**: Frías 42º45'34"N 3º17'50"W, 567 m, sandstone, clay and marl, (SEV 249087); Medina de Pomar, 42º54'53"N 3º29'06"W, 580 m, marl-limestone, marl, clay, and limestone, (SEV 249088); Soncillo, 42º57'48"N 3º47'05"W, 839 m, sandstone, clay, sand and limestone, (SEV 249089); Fresneda de la Sierra, 40°23'10"N 2°08'54"W, 966 m, slate, limestone and quartzite, (SEV 249090); Belorado, 42°24'08"N 3°12'32"W, 793 m, limestone and sandstone, (SEV 249091). **Madrid**: El Escorial, 40°34'38"N 4°08'30"W, 930 m, granites, (SEV 249092); Sierra de Guadarrama, Navacerrada, 40°44'13"N 3°59'52"W, 1,234 m, granites, (SEV 249093); Sierra de Guadarrama, Miraflores de la Sierra, 40°48'51"N 3°44'05"W, 1,034 m, slate and grauwackes, (SEV 249094); Puerto de la Morcuera, 40°49'41"N 3°49'54"W, 1,787 m, slate and grauwackes, (SEV 249095); Rascafría, 40°53'56"N 3°53'74"W, 1,163 m, granites, (SEV 249096); Valmayor reservoir, 40°31'18"N 4°2'55"W, 820 m, granites, (SEV 249097); Collado Mediano, 40°41'19"N 4°03'17"W, 979 m, granites, (SEV 249098); Cercedilla, 40°44'44"N 4°03'51"W, 1,241 m, granites, (SEV 249099); Becerril de la Sierra, 40°43'03"N 3°58'33"W, 1,046 m slate and grauwackes, (SEV 249100). **Salamanca**: Puerto de Vallejera, 40º24'48"N 5º43'61", 1,294 m, granite and sand, (SEV 249101). **Segovia**: Near exist/entrance of Tunel de los Leones, 40°42'44"N 4°9'58"W, 1,230 m, granites, (SEV 249102); San Cristóbal de la Vega, 41°05'46"N 4°38'20"W, 865 m, marl-limestone and limestone, (SEV 249103); Cuéllar, 41°24'28"N 4°20'16"W, 870 m, marl-limestone and limestone, (SEV 249104); Riofrio, 40°52'38"N 4°9'37"W, 1,020 m, granites,

(SEV 249105); San Rafael, 40°42'37"N 4°10'16"W, 1,321 m, granites, (SEV 249106). **Toledo**: San Pablo de los Montes, Las Navillas, 700 m, granites, (SEV 249107). **Valladolid**: Encinas de Esgueva, 41°45'45"N 4°06'05"W, 804 m, conglomerates, sandstone, sand, clay, limestone and gypsum, (SEV 249108); Mojados, toward Megeces, 41°29'40"N 4°36'50"W, 738 m conglomerates, sandstone, sand, clay, limestone and gypsum, (SEV 249109); Cogeces de Izcar, 41°24'48"N 4°32'58"W, 720 m, conglomerates, sandstone, sand, clay, limestone and gypsum, (SEV 249110). ***S. rosmarinifolia* subsp. *castellana***: **Spain**: **Ciudad Real**: 6 km from Manzanares, towards Cuenca, 39°01'87"N 3°18'41"W, 666 m, limestone, (SEV 249111); between Herencia and Puerto Lápices, 39°21'08"N 3°23'98"W, 665 m, limestone, (SEV 249112); Sierra Madrona, Solana del Pino, 38º27'51"N 40º04'57"W, 722 m, slate and quartzite, (SEV 249113); idem, San Lorenzo de Calatrava, 38º28'32"N 3º48'15"W, 808 m, slate and quartzite, (SEV 249114). **Salamanca**: Castellanos de Villiquera, 41º02'65"N 5º40'52"W, 800 m, limestone and quartzite; Santiz, 41º13'43"N 5º49'58"W, 897 m, limestone, (SEV 249115). **Toledo**: Puebla de Montalbán, 39º50'65"N 4º23'81"W, 420 m, sand, clay and limestone, (SEV 249116); Azucaica, 39º52'87"N 3º59'33"W, 458 m, limetone, clay and sandstone, (SEV 249117); between Talavera de la Reina and Calera y Chozas, 39º55'20"N 4º54'55"W, 363 m, conglomerates, sand, sandstone, lime and clay, (SEV 249118). **Zamora**: El Cubo de la Tierra del Vino, 41º16'32"N 5º42'17"W, 853 m, limestone, (SEV 249119); Peleas de Arriba, 41º19'30"N 5º43'44"W, 835 m, marl, marl-limestone and limestone, (SEV 249120); Morales del Vino, 41º27'66"N 5º43'17"W, 681 m, marl, marl-limestone and limestone, (SEV 249121); Corrales, 41º22'81"N 5º43'18"W, 739 m, marl, marl-limestone and limestone, (SEV 249122); Sayago, 41º18'97"N 5º56'99"W, 820 m, limestone and marl, (SEV 249123). ***Santolina semidentata***: **Portugal**: **Tras-os-Montes**: Bragança, Gondesende, 41°50'95"N 6°52'93"W, 749 m, schist and metabasic, (SEV 249124); Vinhais, Vila Verde, 41°50'90"N 6°57'33"W, 773 m, quartzite,

ampelites and lithite, (SEV 249125). **Spain**: **León**: Torneros de Valdería, 42°13'89"N 6°15'02"W, 971 m, slate and quartzite, (SEV 249126); ascending to Peña Trevinca from La Baña, 42º15'03"N 6º43'65"W, 1,520 m, slate and quartzite, (SEV 249127); ascending to El Mirador de Las Médulas from Carrucedo, 42º28'92"N 6º45'50"W, 630 m, slate and quartzite, (SEV 249128); Las Médulas, 42º27'20"N 6º45'74"W, 818 m, alluvial, (SEV 249129); ascending to El Morrederos from Corporales, 42º23'94"N 6º30'68"W, 1,834 m, slate and quartzite, (SEV 249130); Montes de Valdueza, 42º26'40"N 6º35'77"W, 1,155 m, slate and quartzite, (SEV 249131); Ambasaguas, 42º43'28"N 5º22'72"W, 994 m, slate and quartzite, (SEV 249132). **Zamora**: San Ciprian, 42º10'69"N 6º39'27"W, 1,241 m, slate and quartzite, (SEV 249133); Ribadelago, 42º07'06"N 6º44'19"W, 1,008 m, slate, (SEV 249134); Ríonegro del Puente, 42º00'92"N 6º19'65"W, 860 m, slate and quartzite, (SEV 249135); Puebla de Sanabria, 42º03'68"N 6º37'39"W, 913 m, slate, (SEV 249136); San Martín de Castañeda, 42º08'33"N 6º43'38"W, 1,204 m, slate and quartzite, (SEV 249137); Molinaferrera, 42º23'17"N 6º22'15"W, 1,157 m, slate and quartzite, (SEV 249138); Sorribos de Alba, 42º47'59"N 5º39'11"W, 1,000 m, slate and quartzite, (SEV 249139); Valdeteja, 42º55'78"N 5º26'88"W, 1,480 m, slate and quartzite, (SEV 249140); Velilla del Río Carrión, 42º27'97"N 4º53'83"W, 928 m, slate and quartzite, (SEV 249141); Casayo, 42º21'09"N 6º43'09"W, 1,715 m, slate and quartzite, (SEV 249142); Mirantes de Luna, 42º53'05"N 5º51'70"W, 1,153 m, slate and quartzite, (SEV 249143); Peña de Valdorria, 42º53'28"N 5º22'76"W, 1,453 m, slate and quartzite, (SEV 249144); Las Omañas, 42º40'22"N 5º51'29"W, 938 m, slate and quartzite, (SEV 249145); Sorribos de Alba, 42º48'16"N 5º38'11"W, 965 m, slate and quartzite, (SEV 249146); Peñalba de Santiago, Ponferrada, 42º25'66"N 6º32'75"W, 1,005 m, slate and quartzite, (SEV 249147); Muelas de los Caballeros, 42º07'16"N 6º20'62"W, 977 m, slate, (SEV 249148). ***Santolina canescens*** (2*n* = 2*x* = 18): **Spain**: **Albacete**: Sierra del Relumbrar, Povedilla, 38°45'98"N 2°40'82"W, 940 m, marl and quartzite, (SEV 249149).

Almería: Sierra de los Filabres, Tetica Bacares, 37°16'67"N 2°25'89"W, 1,494 m, schist and quartzite, (SEV 249150); idem, ascending to Calar Alto, 37°13'39"N 2°33'26"W, 1,285 m, schist and quartzite limestone, (SEV 249151); idem, Calar Alto, 37°14'85"N 2°37'34"W, 1,445 m, schist and quartzite, (SEV 249152); idem, Las Menas de Tijola, 37°20'36"N 2°30'90"W, 942 m, schist and quartzite, (SEV 249153). **Cádiz**: Sierra de Grazalema, between Puerto de las Palomas and Grazalema, 36°46'17"N 5°22'42"W, 1,057 m, limestone, (SEV 249154). **Córdoba**: Rute, 37°19'62"N 4°20'02"W, 995 m, marl-limestone, (SEV 249155); Priego de Córdoba, 37°27'07"N 4°12'81"W, 674 m, marl-limestone, (SEV 249156); Sierra Horconera, 37°22'26"N 4°19'80"W, 730 m, marl-limestone, (SEV 249157); Cabra, 37°27'56"N 4°25'29"W, 509 m, marl-limestone, (SEV 249158). **Granada**: Sierra de Baza, Zújar, 37°31'67"N 2°48'19"W, 905 m, conglomerates, (SEV 249159); Galera, 37°43'52"N 2°32'15"W, 900 m, conglomerates, (SEV 249160); Baza, 37°31'42"N 2°42'59"W, 771 m, conglomerates, (SEV 249161); Sierra Nevada, Puerto de la Ragua, 37°10'42"N 2°02'10"W, 1,429 m, schist, (SEV 249162); idem, between Bérchules and Puerto de la Ragua**,** 36°58'13"N 3°10'60"W, 1,428 m, schist, (SEV 249163); ibidem, 36°59'44"N 3°10'99"W, 1,683 m, schist, (SEV 249164); ibidem, 36°59'45"N 3°10'68"W, 1,770 m, schist, (SEV 249165); ibidem, 36°59'74"N 3°10'11"W, 1,810 m, schist, (SEV 249166); ibidem, 37°05'53"N 3°01'97"W, 1,866 m, schist, (SEV 249167); ibidem, 37°08'83"N 3°01'76"W, 1,916 m, schist, (SEV 249168); idem, from Dornajo to Duque hotel, 37°07'54"N 3°27'55"W, 1,581 m, schist, (SEV 249169); idem, Güejar-Sierra, 37°09'94"N 3°25'25"W, 1,094 m, schist, (SEV 249170); idem, Padul, 37°01'63"N 3°38'78"W, 805 m, schist, (SEV 249171); Huetor Vega, 37°09'36"N 3°34'54"W, 755 m, schist, (SEV 249172); Alfacar, 37°14'49"N 3°34'15"W, 867 m, schist, (SEV 249173); Sierra Tejeda, Alhama de Granada, 36°59'11"N 3°59'72"W, 961 m, limestone, (SEV 249174); Puerto de la Mora, 37°15'05"N 3°28'78"W, 1,322 m, limestone, (SEV 249175); Pinos Genil, 37°09'16"N 3°29'89"W, 907 m, schist, (SEV 249176); Zafarraya,

36°57'35"N 4°07'73"W, 953 m, limestone, (SEV 249177). **Jaén**: Baños de Jabalcuz, 37°43'99"N 3°98'85"W, 766 m, marl, (SEV 249178); Alcalá la Real, 37º27'74"N 3º56'67"W, 971 m, marl, (SEV 249179); between Los Villares and Valdepeñas de Jaén, 37°37'04"N 3°49'26"W, 1,155 m, marl, (SEV 249180); Torre del Campo towards Jaén, 37°46'20"N 3°51'84"W, 637 m, marl, (SEV 249181); between Jaén and Valdepeñas de Jaén, at 100 m from Fuensanta de Martos crossroads, 37°39'24"N 3°47'83"W, 913 m, marl, (SEV 249182); Valdepeñas de Jaén, 37°35'06"N 3°50'07"W, 899 m, marl, (SEV 249183). **Málaga**: Serranía de Ronda, Ronda, 36°42'90"N 5°10'90"W, 752 m, limestone, (SEV 249184); Antequera, Puerto de las Pedrizas, 36°59'99"N 4°26'98"W, 888 m, clay, (SEV 249185); idem, El Torcal, 36°57'64"N 4°33'72"W, 1,294 m, limestone, (SEV 249186); Sierra de Archidona, Archidona, 37°05'58"N 4°24'08"W, 602 m, limestone, (SEV 249187); Sierra de las Nieves, El Burgo, 36°46'25"N 4°56'18"W, 604 m, limestone, (SEV 249188); Casabermeja, 36°54'10"N 4°26'97"W, 505 m, sand and marl-limestone, (SEV 249189); Cuevas de San Marcos, 37°16'96"N 4°24'44"W, 366 m, limestone, (SEV 249190). **Sevilla**: Between Osuna and El Saucejo, Puerto de los Barrancos Blancos, 37°09'76"N 5°06'72"W, 546 m, limestone, (SEV 249191); Sierra del Tablón, Algámitas, 37°00'64"N 5°10'32"W, 675 m, limestone, (SEV 249192). ***S. pectinata* subsp. *pectinata***: **Spain**: **Albacete**: Alcaraz, 38º38'49"N 2º30'11"W, 959 m, marl and limestone, (SEV 249193); Sierra de Alcaraz, Riopar, 38º29'45"N 2º24'38"W, 910 m, gypsiferous marl, (SEV 249194); idem, between Riopar and Siles, 5 km from Siles, 38º23'59"N 2º33'26"W, 720 m, gypsiferous marl, (SEV 249195). **Ciudad Real**: 10 km from Villahermosa toward Alcaraz, 38º44'35"N 2º46'18"W, 900 m, metapellyite, argillyite, and marl, (SEV 249196). **Granada**: Between Huéscar and Puebla de Don Fadrique, 1 km from Puebla de Don Fadrique, 37º56'36"N 2º26'33"W, 1,164 m, limestone, (SEV 249197); Sierra de la Cabrilla, 37º58'19"N 2º38'25"W, 1,410 m, limestone dolomite, (SEV 249198); Sierra de Castril, ascending to Cerro Laguna from Huéscar, 37º52'50"N

2º45'2"W, 1,680 m, limestone, (SEV 249199); Sierra de la Sagra, 37º56'46"N 2º35'33"W, 1,300 m, limestone, (SEV 249200); idem, Cortijos Nuevos, 37º58'51"N 2º34'24"W, 1,320 m, limestone and sandstone, (SEV 249201). **Jaén:** between Jódar and Huesa, 37º48'28"N 3º9'2"W, 510 m, limestone, (SEV 249202); between Huesa and Quesada, 1 km from Quesada, 37º50'26"N 3º5'29"W, 810 m, limestone and marl, (SEV 249203); Puerto de Tiscar, 37º46'1"N 3º1'5"W, 1,189 m, limestone and marl, (SEV 249204); between Quesada and Cazorla, 37º51'37"N 3º3'35"W, 1,090 m, limestone dolomite, (SEV 249205); Santiago de la Espada, 38º6'59"N 2º33'31"W, 1,300 m, limestone and marl-limestone, (SEV 249206); Sierra de Cazorla, source of Borosa River, 37º57'4"N 2º50'7"W, 690 m, limestone dolomite, (SEV 249207); idem, Parador Nacional, 37º54'46"N 2º57'17"W, 1,060 m, limestone dolomite, (SEV 249208); idem, between Cerro Cabañas and Pozo Alcón, 22 km from Cerro Cabañas, 37º43'58"N 2º58'11"W, 1,260 m, limestone and marl, (SEV 249209); idem, between Quesada and El Chorro, 37º52'13"N 30º3'37"W, 860 m, (SEV 249210); ibidem, 37º53'9"N 3º3'8"W, 1,000 m, limestone dolomite, (SEV 249211); ibidem, 37º53'36"N 3º2'5"W, 1,120 m, limestone and marl, (SEV 249212); idem, between Cazorla and El Tranco, 37º57'58"N 2º55'17"W, 1,260 m, limestone dolomite, (SEV 249213); ibidem, 37º59'58"N 2º54'26"W, 1,340 m, limestone dolomite, (SEV 249214); ibidem, 38º3'11"N 2º52'14"W, 1,500 m, limestone dolomites, (SEV 249215); ibidem, 38º15'31"N 2º57'28"W, 1,400 m, limestone dolomite, (SEV 249216); ibidem, 5.6 km from Burunchel, 37º56'55"N 2º57'34"W, 1,240 m, limestone dolomite, (SEV 249217); Sierra de Las Villas, between Mogón and La Fresnedilla, 38º3'59"N 2º56'18"W, 1,130 m, limestone dolomite, (SEV 249218); idem, Bardazoso, 38º6'10"N 2º51'21"W, 1,340 m, limestone dolomite, (SEV 249219), idem, 1.8 km from Aguacebas reservoir bridge, 38º2'28"N 2º57'14"W, 1,130 m, limestone dolomite, (SEV 249220); idem, between Mogón and El Tranco, 38º9'3"N 2º52'44"W, 1,210 m, limestone, (SEV 249221); Sierra de Mágina, 37º43'52"N 3º30'54"W, 1,400 m, limestone, (SEV 249222);

idem, 37º42'36"N 3º30'35"W, 1,000 m, limestone, (SEV 249223); Sierra de Segura, Hornos, 38º13'18"N 2º42'50"W, 867 m, limestone and marl-limestone, (SEV 249224); idem, La Hoya de Cambrón 38º23'41"N 2º38'23"W, 1,100 m, limestone, (SEV 249225); idem, Orcera, 38º19'32"N 2º40'8"W, 840 m, gypsiferous marl, (SEV 249226); idem, Pontones, 38º23'41"N 2º38'23"W, 1,350 m, limestone dolomite, (SEV 249227); idem, Don Domingo, 38º23'41"N 2º38'23"W, 1,530 m, limestone dolomite, (SEV 249228); idem, Siles, 38º23'18"N 2º34'54"W, 800 m, gypsiferous marl, (SEV 249229); idem, Segura de la Sierra, 38º17'55"N 2º38'34"W, 1,100 m, limestone dolomite, (SEV 249230); idem, Yelmo de Segura, 38º15'41"N 2º39'55"W, 1,500 m, limestone, (SEV 249231); Sierra del Pozo, Cortijo de las Acebadillas, 37º51'12"N 2º56'23"W, 1,890 m, bioclastic limestone and conglomerate, (SEV 249232); idem, Nava de San Pedro, 37º54'57"N 2º56'18"W, 1,740 m, bioclastic limestone and conglomerate, (SEV 249233). **Murcia**: Moratalla, Sierra del Buitre, 38º9'48"N 1º54'28"W, 1,200 m, limestone, (SEV 249234). ***Santolina pectinata* subsp. *montiberica***: **Spain**: **Cuenca**: Almodóvar del Pinar, 39º44'1"N 1º54'46"W, 920 m, limestone, (SEV 249235); between Almodóvar del Pinar and Puerto de Tórdigas, 39º47'26"N 1º56'34"W, 1,000 m, limestone, (SEV 249236); between Puerto de Tórdigas and Cuenca, 40º8'32"N 2º20'44"W, 1,140, limestone, (SEV 249237); La Almarcha, 2 km from La Almarcha, 39º49'29"N 2º21'8"W, 890 m, clay, (SEV 249238); idem, 5 km from La Almarcha, 39º42'41"N 2º22'29"W, 920 m, clay, (SEV 249239); between Cuenca and Ciudad Real, 16 km from Villa Escusa de Haro, 39º38'5"N 2º34'50"W, 880 m, gypsiferous marl, (SEV 249240); between Almarcha and Cuenca, at Belmontejo crossroads, 39º43'55" N 2º21'25", 850 m, clay, (SEV 249241); Mota del Cuervo, 5 km from Mota del Cuervo towards Cuenca, 39º30'58"N 2º50'47"W, 740 m, gypsiferous marl, (SEV 249242); Cuenca to Ciudad Real road, after the detour towards La Almarcha, 39º41'46"N 2º22'33"W, 840 m, gypsiferous marl, (SEV 249243); between Villar de Olalla and San Lorenzo de la Parrilla, 39º52'7"N 2º20'6"W, 910 m, limestone, (SEV 249244); between

Cuenca and Almodóvar del Pinar, at the Olmeda del Rey crossroads, 39º50'6"N 2º0'56"W, 1,090 m, gypsiferous marl, (SEV 249245); Olmeda del Rey, 39º48'53"N 2º4'22"W, 910 m, marl, (SEV 249246); Valeria, 39º48'55"N 2º8'24"W, 880 m, marl, (SEV 249247). Valverde de Júcar, 39º43'43"N 2º13'10"W, 820 m, limestone and marl, (SEV 249248); Olivares de Júcar, 39º45'47"N 2º20'39"W, 850 m, marl, (SEV 249249); Huete, 40º8'18"N 2º41'27"W, 840 m, limestone, (SEV 249250); Los Pozuelos, Barchín del Hoyo, 39º39'50"N 2º4'28"W, 1,000 m, limestone, (SEV 249251); Tarancón, 39º59'23"N 3º0'32"W, 808 m, limestone, (SEV 249252); Villarejo de Fuentes, 39º47'19"N 2º41'36"W, 900 m, limestone, (SEV 249253). **Mixed populations of *S. rosmarinifolia* subsp. *rosmarinifolia* and *S. rosmarinifolia* subsp. *castellana***: **Spain**: **Salamanca**: Calzada de Valdunciel, 41º04'67"N 5º41'62"W, 807 m, granites, (SEV 249254). **Toledo**: Mocejón, 39º56'34"N 3º54'29"W, 475 m, sand, clay, gypsum and limestone, (SEV 249255). **Valladolid**: Olmedo, 41°18'25"N 4°41'0.8"W, 800 m conglomerates, sandstone, sand, clay and granites, (SEV 249256). **Zamora**: Cubillos, 41º34'97"N 5º45'81"W, 700 m, limestone, (SEV 249257)**. Mixed populations of *S. pectinata* and *S. rosmarinifolia* subsp. *castellana***: **Spain**: **Albacete**: Between Villanueva de la Fuente and Alcaraz, 38°45'60"N 2°23'58"W, 1,033 m, schist, (SEV 249258); Sierra de Alcaraz, La Molata, 38°44'09"N 2°07'54"W, 1,124 m, marl and marl-limestone, (SEV 249259). Mixed populations of ***S. rosmarinifolia* subsp. *rosmarinifolia*, *S. rosmarinifolia* subsp. *castellana* and *S. semidentata***: **Spain**: **Zamora**: Ferreras de Abajo, 41º54'69"N 6º03'09"W, 793 m, granites, (SEV 249260). **Valladolid**, Valdunquillo, 42º09'06"N 5º22'25"W, 760 m, conglomerates, sandstone, sand, clay, limestone and gypsum, (SEV 249261). ***Santolina x oblongifolia*, *nothosp.***: **Spain**: **Ávila**: Puerto del Pico, 40º19'69"N 5º00'21"W, 1,352 m, granites, (SEV 249262); Puerto del Tremedal, 40º22'90"N 5º37'09"W, 1,602 m, granites, (SEV 249263); Puerto de Mijares, 40º19'21"N 4º48'72"W, 1,570 m, granites, (SEV 249264); Puerto de Tornavacas, 40º16'07"N 5º39'07"W, 1,284 m,

granites, (SEV 249265); Barco de Ávila, 40º22'25"N 5º31'31"W, 1,021 m, granites, (SEV 249266); near to Plataforma de Gredos, 40º17'72"N 5º13'62"W, 1,665 m, granites, (SEV 249267). **Salamanca**: Candelario, 40º22'86"N 5º44'50"W, 1,133 m, granites, (SEV 249268); Navacarro, 40º23'10"N 5º42'88"W, 1,149 m, granites, (SEV 249269).

Appendix S2. Quantitative morphological characteristics studied.

1- DPL, plant diameter; **2- APL**, plant height; **Stem characteristics**: **3- NTFP**, number of primary branches; **4- NRTFP**, number of branches of the flowering stems; **5- LTFP**, length of flowering stems; **6- LPT**, length of stem peduncle; **7- DTF**, diameter of flowering stems; **8- LTV**, length of sterile stems; **Leaves of the flowering stem characteristics**: **9- LHB**, basal leaf length; **10- LHIF**, lower leaf length; **11- LHMF**, middle leaf length; **12- LHSF**, upper leaf length; **13- AHB**, basal leaf width; **14- AHLF**, lower leaf width; **15- AHMF**, middle leaf width; **16- AHSF**, upper leaf width; **17- NLHB**, number of basal leaf lobes; **18- NLHIF**, number of lower leaf lobes; **19- NLHMF**, number of middle leaf lobes; **20- NLHSF**, number of upper leaf lobes; **21- LLHIF**, length of lower leaf lobes; **22- LLHMF**, length of middle leaf lobes; **23- LLHSF**, length of upper leaf lobes; **Leaves of the sterile stem characteristics**: **24- LHIV**, lower leaf length; **25- LHMV**, middle leaf length; **26- LHCV**, fascicular leaf length; **27- AHIV**, lower leaf width; **28- AHMV**, middle leaf width; **29- AHCV**, fascicular leaf width; **30- NLHIV**, number of lower leaf lobes; **31- NLHMV**, number of middle leaf lobes; **32- NLHCV**, number of fascicular leaf lobes; **33- LLHIV**, length of lower leaf lobes; **34- LLHMV**, length of middle leaf lobes; **35- NHC/N**, number of branch leaves per node; **Capitulum characteristics**: **36- CD**, diameter; **37- CA**, height; **Receptacle characteristics**: **38- ID**, diameter; **39- IA**, height; **Involucral bract characteristics**: **40- NBI**, number of the involucral bracts; **41- LBE**, base length of outer bracts; **42- LBM**, base length of middle bracts; **43- LB1I**: base length of the first row of inner bracts; **44- LB2I**, base length of the second row of inner bracts; **45- ABE**, base width of outer bracts; **46- ABM**, base width of middle bracts; **47- AB1I**, base width of the first row of inner bracts; **48- AB2I**, base width of the second row of inner bracts; **49- LABE**, appendage length of outer bracts; **50- LABM**, appendage length of middle bracts; **51-**

LAB1I, appendage length of the first row of inner bracts; **52- LAB2I**, appendage length of the second row of inner bracts; **53- AABE**, apical width of the outer bract appendage; **54- AABM**, apical width of the middle bract appendage; **55- AAB1I**, apical width of the first row of the inner bract appendage; **56- AAB2I**, apical width of the second row of the inner bract appendage; **57- ALBE**, lateral width of the outer bract appendage; **58- ALBM**, lateral width of the middle bract appendage; **59- ALB1I**, lateral width of the first row of the inner bract appendage; **60- ALB2I**, lateral width of the second row of the inner bract appendage; **Interseminal bract characteristics**: **61- LBP**, base length; **62- ABP**: base width; **Reproductive characteristics: Flower characteristics**: **63- LANTP**, anther length for peripheral flowers; **64- LTECP**, theca length for peripheral flowers; **65- LESTP**, style length for peripheral flowers; **66- LPP**, corolla lobe length for peripheral flowers; **67- LCP**, corolla length for peripheral flowers; **68- LTFP**, corolla tube length for peripheral flowers; **69- ALFP**, corolla aperture for peripheral flowers; **70- ATFP**, corolla tube aperture for peripheral flowers; **71- LANTC**, anther length for central flowers; **72- LTECC**, theca length for central flowers; **73- LESTC**, style length for central flowers; **74- LPC**, corolla lobe length for central flowers; **75- LCC**, corolla length for central flowers; **76- LTFC**, corolla tube length for central flowers; **77- ALFC**, corolla aperture for central flowers; **78- ATFC**, corolla tube aperture for central flowers; **Achene characteristics**: **79- LAQP**, peripheral achene length; **80- AAQP**, peripheral achene width; **81- LAQC**, central achene length; **82- AAQC**, central achene width.

Appendix S3. Qualitative morphological characteristics studied.

1- PLC, plant colour: (1) plant with bright dark-green or yellowish-green stems with dark-green leaves, sterile stems and leaves of the sterile stems usually greyish-glaucous or dark-green; (2) plant with bright olive-green or yellowish-green stems with bright olive-green leaves (3) plant olive-green or olive green to brown-red on occasion with sterile stems usually greyish-glaucous, (4) plant greyish-glaucous; **2- PUB**, plant pubescent: (1) glabrous, (2) sericeous, (3) tomentose, (4) tomentose to glabrescent; **3- PVG**, viscose gland covering: (1) plant with viscose glands, (2) plant with flowers and interseminal bracts with viscose glands; **4- PRT**, plant habit: (1) decumbent with variable flowering stems at individual level: ascending, erect-patent and erect, (2) procumbent with flowering stems patent and divergent, (3) decumbent-rooting with variable flowering stems at individual level: ascending, erect-patent and erect, (4) ascending; **5- TFQ**, fragile flowering stems: (1) from the apex to the base, (2) near the base; **6- TFZ**, flowering stem characteristics: (1) solid, (2) not solid near the capitulum, (3) not solid from the apex to the base; **7- TVZ**, sterile stem characteristics: (1) solid, (2) not solid; **8- PDS**, peduncle shape: (1) not thickened above, (2) slightly thickened above (3) strongly thickened above; **9- BFLS**, basal and fascicular leaves shape: (1) spatulate, (2) obovate, (3) elliptical, (4) lanceolate, (5) subterete; **10- BFLG**, groove of the basal and fascicular leaves: (1) not grooved, (2) grooved from the apex to the base on both sides, (3) grooved from the apex to the base above and on the lower 1/2 or 1/3 below, (4) strongly grooved from the apex to the base on both sides; **11- MHBF**, incision of the basal and fascicular leaves: (1) pinnatifid, (2) imbricate scaly-dentate, (3) impressed-tuberculate-denticulate; **12- FHIF**, shape of the lower leaves of the flowering stems: (1) spatulate, (2) lanceolate, (3) elliptical, (4) subterete, (5) linear; **13- FHMF**, shape of the middle leaves of the flowering stems: (1) spatulate, (2) elliptical, (3) lanceolate, (4) subterete, (5) linear; **14- FHSF**, shape of the upper leaves of the flowering stems: (1) obovate, (2)

elliptical, (3) lanceolate, (4) linear, (5) triangular; **15- FHIV**, shape of the lower leaves of the sterile stems: (1) spatulate, (2) lanceolate, (3) subterete, (4) linear; **16- FHMV,** shape of the middle leaves of the sterile stems: (1) spatulate, (2) elliptical, (3) lanceolate, (4) subterete, (5) linear; **17- MHIF**, incision of the lower leaves of the flowering stems: (1) pinnatisect, (2) pinnatisect to pinnatifid, (3) pinnatipartite, (4) pinnatipartite to pinnatifid, (5) pinnatipartite to dentate, (6) pinnatifid, (7) dentate or scaly-dentate, (8) imbricate-tuberculate-denticulate, (9) entire; **18- MHMF**, incision of the middle leaves of the flowering stems: (1) pinnatisect, (2) pinnatisect to pinnatifid, (3) pinnatipartite, (4) pinnatipartite to pinnatifid, (5) pinnatipartite to dentate, (6) pinnatifid, (7) dentate, (8) scaly-dentate, (9) imbricate-tuberculate-denticulate, (10) entire; **19- MHSF**, incision of the upper leaves of the flowering stems: (1) pinnatisect, (2) pinnatisect to pinnatifid, (3) pinnatifid, (4) dentate, (5) scaly-dentate, (6) entire; **20- MHIV**, incision of the lower leaves of the sterile stems: (1) pinnatisect, (2) pinnatisect to pinnatifid, (3) pinnatisect to dentate, (4) pinnatipartite, (5) pinnatipartite to pinnatifid, (6) pinnatipartite to dentate, (7) pinnatifid, (8) dentate, (9) scaly-dentate, (10) imbricate-tuberculate-denticulate, (11) entire; **21- MHMV**, incision of the middle leaves of the flowering stems: (1) pinnatisect, (2) pinnatisect to pinnatifid, (3) pinnatipartite, (4) pinnatipartite to dentate, (5) pinnatifid, (6) dentate, (7) scaly-dentate, (8) imbricate-tuberculate-denticulate, (9) entire; **22- MIA**, margin of the leaves: (1) leaves with thickened and involute-appressed margin, (2) leaves without thickened and involute-appressed margin; **23- LIIF**, **24- LIMF**, **25- LISF**, lobe insertion of the lower, middle and upper leaves of the flowering stems, and lobe insertion of the lower (**26- LIIV**) and middle (**27- LIMV**) leaves of the sterile stems: (1) without lobes, (2) lobes along upper 1/3, (3) lobes along upper 1/2, (4) lobes along upper 2/3, (5) lobes from the apex to the base; **28- APH**, leaf apex: (1) plant with rounded leaf apex, (2) plant with rounded and truncate leaf apex, (3) plant with rounded, truncate, and trilobulate leaf apex, (4) plant with leaf with

obtuse mucronate apex, (5) plant with acute mucronate and obtuse mucronate leaf apex; **29- FL**, lobe shape: (1) elliptical with obtuse mucronate apex, (2) linear with acute mucronate or obtuse mucronate apex (3) rounded; **30- CPS**, capitulum shape: (1) hemispheric, (2) campanulate, (3) subglobose; **31- CPU**, capitulum base: (1) not umbilicate, (2) umbilicate, (3) strongly umbilicate; **32- RCP**, receptacle shape: (1) conic, (2) hemispheric, (3) subglobose (4) lenticular; **33- FBE**, **34- FBM**, **35- FB1I**, **36- FB2I**, shape of the outer, middle, first and second row of inner bracts, respectively: (1) ovate, (2) ovate-triangular, (3) triangular, (4) elliptical, (5) oblong, (6) absent; **37- FBIS**, shape of the interseminal bracts: (1) obovate, (2) elliptical, (3) oblong; **38- FAPBE**, **39- FAPBM**: apex shape of the outer and middle bracts, respectively: (1) not acuminate, (2) acuminate; **40- APC**, involucral bracts appendage colour: (1) hyaline, not fragile, (2) dark copperish, fragile; **41- BEAD**, **42- BMAD**, **43- BI1AD**, **44- BI2AD**, appendage insertion of the outer, middle and first and second row of inner bracts, respectively: (1) lacerate and non-decurrent, (2) lacerate or lacerate to fimbriate in the apex and slight fimbriate to the base, (3) lacerate along upper 1/3, (4) lacerate or lacerate to fimbriate along upper 1/3 and slight fimbriate along lower 2/3, (5) lacerate along upper 1/2, (6) lacerate or lacerate to fimbriate along upper 1/2 and slight fimbriate along lower 1/2, (7) lacerate to lacerate-denticulate or lacerate to fimbriate along upper 1/2, (8) lacerate to lacerate-denticulate or lacerate to erose from the apex to the base, (9) lacerate to lacerate-denticulate or lacerate to fimbriate from the apex to the base; **45- BISAD**, appendage insertion of the interseminal bracts: (1) without appendage, (2) decurrent along upper 1/3, (3) decurrent along upper 1/2; **46- BEAQ**, shape and insertion of the keel of the outer bracts: (0) carinate, (1) strongly carinate; **47- BMAQ**, **48- BI1AQ**, **49- BI2AQ**, shape and insertion of the keel of the middle and first and second row of inner bracts, respectively: (1) carinate from the apex to the base, (2) carinate in the middle zone, (3) strongly carinate from the apex to the base; **50- PLBIS**, hair characteristics of the

interseminal bracts: (1) simple, (2) modified, (3) simple and modified, (4) glabrous; **51- PBIS**, interseminal bracts pubescent: (1) glabrous, (2) pilose, (3) villous, (4) sericeous, (5) tomentose; **52- FLPS**, position of the peripheral and central flowers: (1) flowers do not coat the capitulum, the central flowers erect and the peripheral flowers erect or at an angle of 90º, (2) flowers coat the capitulum; **53- CFF**, colour of fresh flowers: (1) orange-yellow, (2) yellow.

Appendix S4.

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Figure A1. Detailed phylogeny of the 2516 individuals included in this study showing relationships between subspecies and populations. Because of the number of individuals, the tree is not legible if printed; it should be looked at on-screen, using the zoom tool to get appropriate magnification. Species, subspecies and varieties are identified by name, by branch color, and are delimited using brackets. When a taxon occurs in more than one position, numbers identify each clade or grade (e.g. *S. oblongifolia*-2 is the second clade or grade of that species, from left to right). Populations are identified by vertical numbers immediately above the tree and below individual number. To the right, about 60% of the individuals were cut from the tree (B, C) and these parts of the tree are presented in parts B and C of the figure. Figures in the paper represent simplification of this figure, in part or whole.