**Hypericum scruglii** sp. nov. (Guttiferae) from Sardinia

Gianluigi Bacchetta, Salvatore Brullo and Cristina Salmeri

S. Brullo (salvo.bruno@gmail.com), Univ. degli Studi di Catania, Dip.to Botanica, Via A. Longo 19, IT–95125 Catania, Italy.
– G. Bacchetta, Univ. degli Studi di Cagliari, Dip.to di Scienze Botaniche, Centro Conservazione Biodiversità (CCB), Viale S. Ignazio da Laconi 13, IT–09123 Cagliari. – C. Salmeri, Univ. degli Studi di Palermo, Dip.to di Scienze Botaniche, Via Archirafi 38, IT–90123 Palermo, Italy.

A new species of *Hypericum* (Guttiferae) from Sardinia, *H. scruglii*, is described and illustrated. It occurs on damp soil, near springs or streams with freshwater, where it grows with numerous hygrophytes. This diploid species (2n = 16) belongs to the sect. *Adenosepalum* and is closely related to *H. tomentosum*, a species widespread in the west Mediterranean region.

During field investigations in Sardinia, very peculiar populations of *Hypericum* L. were found occurring on damp soils and limited to calcareous substrates. These plants showed a close morphological and ecological relationship with *H. tomentosum* L., a species belonging to sect. *Adenosepalum* Spach. As emphasized by Robson (1996), the Sardinian populations of *H. tomentosum* tend towards *H. pubescens* Boiss. A detailed analysis of living material collected from many localities on the island allowed us to verify that these plants were remarkably different from typical specimens of *H. tomentosum* and, in addition, were totally unlike *H. pubescens*. The Sardinian populations differ from both related species with respect to the shape and size of leaves, floral structures and capsules. Based on this, we concluded that they constitute a new species.

**Material and methods**

The investigation is based on numerous plants collected from 11 Sardinian localities, some of which (5) were cultivated in the Botanical Gardens of Cagliari and Catania, as well as on herbarium material at CAG, CAT, FI and TO. In addition, many herbarium specimens of *Hypericum tomentosum* and *H. pubescens* have been examined at CAT, FI and VAL. Karyological observations were made on mitotic plates from root tip cells of ca 50 germinated seeds, pre-treated for 3 h with 0.3% colchicine water solution at room temperature, fixed in Carnoy and stained according to the Feulgen technique. All metaphases were examined using the image analysis systems IKAROS 4.6 (Metasystem) and Zeiss Axiovision 5.1.

**Hypericum scruglii Bacch., Brullo & Salmeri** sp. nov. (Fig. 1, 2)

*A Hyperico tomentoso foliis suborbicularibus vel orbiculari-ellipticis, corolla 18–20 mm in diametro, sepalis subaequalibus ovato-lanceolatis, acuminatis, 1.2–1.8 mm latis, petalis irregulariter oblongo-oblanceolatis, 10–11 mm longis, 3.5–4.5 mm latis, stamina 8 mm longa, antheris 0.4 mm longis, 0.5 mm latis, stylis usque ad 4.7 mm longis, reflexis in fructu, capsule elipsoidea, sepali longiora, 5.0–6.5 mm longa, 2.5–2.7 mm lata, loculi longe apiculatis differt.*

**Type**: Italy, CE Sardinia, Montarbu di Seui, Nuraghe Ardasai, 39°53.32.77’N, 9°20.27.90’E, 19 Jul 2004, Brullo and Bacchetta, s.n. (holotype: CAT, isotypes: CAG, CAT, FI).

Perennial herb 5–30 cm tall; branches herbaceous, tomentose, prostrate to decumbent, unbranched, rooting in their lower half, the lower internodes almost shorter than their leaves. Leaves sessile, lamina 9–17 × 7–13 mm, suborbicular to orbicular–elliptic, concolorous, green-glaucescent, plane, apex rounded, margin plane, base subcordate; venation in 2–3 basal pairs, curved, ascending and ending freely, 1 upper pair incurved and united at apex; marginal glands black, irregularly distributed and not prominent. Cymes 3–25-flowered, from up to 1–3(6) nodes, corymbiform; pedicels 1–3 mm long; bracts not auriculate, bracteoles linear-subulate, with black marginal glands. Flowers 18–20 mm in diameter, buds ellipsoid, obtuse. Sepals 4.0–5.5 × 1.2–1.8 mm, subequal, ovate–lanceolate, acuminate, with 10–14 marginal black glands on cilia 0.5–4.0 mm long and 1 large black gland at the apex, black laminar glands absent; veins 5. Petals bright yellow, 10–11 × 3.5–4.5 mm, irregularly oblong-oblancoolate, obtuse, apiculus lateral, prominent and acute, dentate in the upper part; interdental black...
marginal glands few, not prominent. Stamens 33, conspicuously 3-fascicled, 3 innermost and 8 outermost, 8 mm long. Anthers 0.4–0.5 mm, with black gland. Ovary 1.7 × 1.3 mm, narrowly ovoid–pyramidal. Styles up to 4.7 mm long, reflexed in fruit. Capsule 5.0–6.5 × 2.5–2.7 mm, ellipsoid, longer than sepals, tridentate with loculi long apiculate. Seed brownish, 0.7–0.9 mm long, testa finely reticulate–scalariform. Flowering occurs in late Jun–Jul and fruiting in Aug–Sep.

**Habitat, distribution and etymology**

*Hypericum scruglii* is generally linked to calcareous substrates like limestone, conglomerate, travertine, sandstone and marl, where it grows exclusively on damp soil, near springs or streams with freshwater. Occasionally it is possible to find it in pools. It is especially linked to subalkaline and alkaline soils, not much developed from the pedogenetic point of view. It grows under a pluviseasonal Mediterranean bioclimatic, within the lower meso-Mediterranean and lower supra-Mediterranean belts, with a lower subhumid and lower humid ombrotype. It is a member of hygrophilous plant communities characterized by many Sardinian and Cyno-Sardinian endemics like *Borago morisiana* Bigazzi & Ricceri, *B. pygmaea* (DC.) Chater & Greuter, *Moriella monantha* (Viv.) Barbey, *Polygala sardoa* Chodat and *Ranunculus cordiger* ssp. *diffiusus* (Moris) Arrigoni. Other hygrophyles like *Carex flaca* Schreb. ssp. *serrulata* (Biv.) Malagarriga, *Mentha pulegium* L., *Oenanthe pimpinelloides* L., *Platanthera algeriensis* Batt. & Trab., *Schoenus nigricans* L. and *Solenopsis bivonae* (Tineo) M. B. Crespo, Serra & Juan also occur in the same habitat.

*Hypericum scruglii* is distributed in centraleast and southeast Sardinia, in particular in the Sarcidano, Barbagia of Seulo, Ogliastra and Quirra areas (Fig. 3). Only two old herbarium specimens are from the Nurra and Sassari.
districts (northwest Sardinia). However, these records are not quoted by Bagella and Urbani (2006) and need to be confirmed. The species name is given in honour of the Sardinian botanist Antonio Scrugli.

**Conservation status**

Presently the populations of *H. scrugli*, although widely distributed, are threatened by overgrazing and human activities (groundwater extraction, roads and manufactures). For this reason it is suggested to be added to the regional red lists of the IUCN, as a ‘Vulnerable’ species (VU) based on the criteria B1ab (ii, iii, v) + 2ab (ii, iii, v) (according to IUCN 2001, 2006).

**Karyology**

*Hypericum scruglii* is a diploid species with the somatic chromosome number $2n = 16$ (Fig. 4). The chromosomes are relatively small, therefore, a detailed, statistically supported karyotypic analysis was not possible. However, the total chromosome length ranges from approximately 2.85 to 0.5 μm and some plates clearly show the presence of larger metacentric chromosomes together with punctiform ones. It must be noticed that the same number ($2n = 16$) has been reported for the allied species *H. tomentosum* L. (from Portugal, Queiros 1991, Robson 1996).

**Discussion and conclusions**

In the classification proposed by Robson (1968, 1996) and Ramos Nuñez (1983, 1993), *H. scruglii* belongs in sect. *Adenosepalum* Spach owing to its pubescent branches and leaves, black glands on leaves, sepals, petals and anthers,
Table 1. Diagnostic morphological characters of Hypericum scruglii, H. tomentosum and H. pubescens.

<table>
<thead>
<tr>
<th>Characters</th>
<th>H. scruglii</th>
<th>H. tomentosum</th>
<th>H. pubescens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Habit</td>
<td>perennial herb, 5–30 cm tall</td>
<td>perennial herb, 9–53(90) cm tall</td>
<td>perennial herb, 10–70 cm tall</td>
</tr>
<tr>
<td>Branches</td>
<td>herbaceous, prostrate to decumbent, unbranched, rooting in the lower half, the lower internodes almost shorter than the leaves</td>
<td>partially woody, erect or decumbent to prostrate, branching and sometimes rooting at base, internodes longer than the leaves</td>
<td>herbaceous, erect or decumbent and rarely prostrate, unbranched, internodes almost longer than the leaves</td>
</tr>
<tr>
<td>Leaves</td>
<td>sessile, lamina 9–17 × 7–13, suborbicular to orbicular-elliptic, concolorous, green-glaucenscent, apex rounded, base subcordate</td>
<td>sessile, lamina 5–26 × 2–11 mm, elliptic-oblong to triangular-ovate, concolorous, green, apex rounded to obtuse, base cuneate to truncate or subcordate</td>
<td>sessile, lamina 6–40 × 2–16 mm, narrow oblong to oblong-oblancoate, concolorous, green, apex subobtuse to rounded, base rounded to cordate-amplexical</td>
</tr>
<tr>
<td>Cymes</td>
<td>3–25-flowered, from up to 1–3(6) nodes, corymbiform</td>
<td>3–70-flowered, from up to 3 nodes, curved-corymbiform to cylindric linear</td>
<td>3–5-flowered, from up to 3 nodes, curved-corymbiform linear</td>
</tr>
<tr>
<td>Bracteoles</td>
<td>linear-subulate</td>
<td></td>
<td>15–30 mm in diameter, buds cylindric-ellipsoid, obtuse</td>
</tr>
<tr>
<td>Flowers</td>
<td>18–20 mm in diameter, buds ellipsoid, obtuse</td>
<td>10–15(20) mm in diameter, buds ellipsoid, obtuse to rounded-obtuse</td>
<td>5–10 × 1.5–2.5 mm, subequal, linear-lanceolate to lanceolate, long aristate, with 3–5 sessile marginal black glands on each side, laminar and apical black glands absent, veins 3(5)</td>
</tr>
<tr>
<td>Sepals</td>
<td>4.0–5.5 × 1.2–1.8 mm, subequal, ovate-lanceolate, acuminate, with 10–14 marginal black glands on each side, on cilia 0.5–4.0 mm long, laminar black glands absent but with big black apical gland, veins 5</td>
<td>3–5 × 2.5–3.5 mm, subequal to unequal, lanceolate to ovate or broadly elliptic, acute to usually shortly aristate, with 8–16 marginal black glands on each side, on cilia 0.1–1 mm long, with black laminar glands and big black apical gland, veins (3)5–7</td>
<td>9–15 × 3.0–6.5 mm, oblanceolate, rounded, apicalus lateral, apiculate or absent, entire or slightly dentate in the upper part; marginal to inframarginal glands black, few, not or scarcely prominent</td>
</tr>
<tr>
<td>Petals</td>
<td>10–11 × 3.5–4.5 mm, irregularly oblanceolate, obtuse, apiculus lateral, prominent and acute, dentate in the upper part; interdental marginal glands black and few, not prominent</td>
<td>6–9 × 2.5–3.5 mm, oblanceolate, rounded, apiculus lateral, shortly acute to absent, entire or slightly dentate in the upper part; marginal to inframarginal glands black, few, subterminal and not prominent</td>
<td>9–15 mm, subequal, linear-lanceolate to lanceolate, long aristate, with 3–5 sessile marginal black glands on each side, laminar and apical black glands absent, veins 3(5)</td>
</tr>
<tr>
<td>Stamens</td>
<td>33, clearly 3-fascicled, 3 inner and 8 outer, 8 mm long</td>
<td>25–35, clearly 3-fascicled, longest 5–7 mm</td>
<td>30–50, clearly 3-fascicled, longest 6–11 mm</td>
</tr>
<tr>
<td>Anthers</td>
<td>0.4 mm long and 0.5 mm wide</td>
<td>0.5 mm long and 0.8 mm wide</td>
<td>0.6 mm long and 0.4 mm wide</td>
</tr>
<tr>
<td>Ovary</td>
<td>1.7 × 1.3 mm, narrowly ovoid-pyramidal</td>
<td>1.5–2.0 × 1.0–1.3 mm, narrowly ovoid-pyramidal</td>
<td>2–3 × 1–2 mm, ovoid-ellipsoid to elliptoid</td>
</tr>
<tr>
<td>Style</td>
<td>up to 4.7 mm long; reflexed in fruit</td>
<td>5.0–6.3 mm long; patent in fruit</td>
<td>5.7 mm long; spreading-incurved in fruit</td>
</tr>
<tr>
<td>Capsule</td>
<td>5.0–6.5 × 2.5–2.7 mm, ellipsoid, longer than sepalae, tridentate with loculi longely apiculate</td>
<td>4.5 × 3–4 mm, ovoid-subglobose, shorter than sepalae, truncate with loculi rounded at apex</td>
<td>6–7 × 3.5–5.0 mm, ovoid, shorter than sepalae, tridentate with loculi short apiculate at apex</td>
</tr>
<tr>
<td>Seed</td>
<td>brownish, 0.7–0.9 mm long, testa finely reticulate-scalariform</td>
<td>greyish-brown, 0.9–1.0 mm long, testa finely reticulate-scalariform</td>
<td>purplish, 0.6–1.0 mm long, testa finely scalariform</td>
</tr>
</tbody>
</table>
Therefore, *H. scruglii*, being a diploid species with 2n = 16, is very unlikely to have evolved from a hybridization process between these two taxa.

In conclusion, based on our morphological and karyological observations, we hypothesize that *H. scruglii* arose from populations of *H. tomentosum* as a consequence of geographical isolation.

**Acknowledgements** — We thank the keepers and curators of the following herbaria: FI, TO, CAG, CT and VAL.

**Additional specimens examined**

*Hypericum scruglii* Bacch., Brullo & Salmeri (paratypes): Sardinia. In apricis collinis, Sardinia, Jun–Jul, Moris (FI); In pratis prasertum maritimis, May, Moris 237 (TO); Ad vias inter Esterzili et Nurra, Jul 1826, Moris (TO); In Sardinia orientalis Perdas de Fogu, May, Moris (TO); In umentibus presso Sassari, 1840, Lisa (TO); Contorni d’Isili, Jul 1860, Gennari (FI); Ad rivulos Horti Marchionas de Laconi, 25 Jun 1863, Ascherson (FI); Laconi, Pauli, 8 Jun 1864, sine leg. (TO); Ibid., 20 Aug 1864, sine leg. (TO); Laconi, boschetro, 25 Jun 1864, sine leg. (TO); Laconi, Pauli gora, 27 Aug 1869, sine leg. (TO); Ulassai, alla Corci, luoghi umidi, 1 Aug 1894, Martelli (FI); Isili, in collibus, 15 May 1894, Martelli (FI); Isili, Sep 1901, Cavara & Grande (FI); Circondario di Arizio, 1935, Porcu (FI); Genn’i Acca (Montarbu – Seui), 8 Jun 2001, Bacchetta, Brullo, Casti & Giusso (CAT); M. te Tonneri, rivoli presso il Nuraghe di Ardasai, 8 Jun 2001, Bacchetta, Brullo, Casti & Giusso (CAT); Sa Scala e sa Marra, Seui (NU), 9 Jun 2001, Bacchetta, Brullo, Casti, Català & Giusso 163/01 (CAG, CAT); Mura Gessa, Seui (NU), 9 Apr 2002, Bacchetta, Casti, Iiriti, Pontecorvo & Serra 85/02 (CAG); Santa Sofia, Laconi (NU), 23 Apr 2002, Bacchetta, Casti & Pontecorvo 156/02

Figure 5. *Hypericum tomentosum*. (A) habit, (B) leaf, (C) flower, lateral view, (D) flower, upper view, (E) petals, (F) bud, (G) calyx, (H) sepal, (I) calyx and fruit, (J) anthers, (K) stigma, (L) fruits, (M) seed.

Hypericum tomentosum L.

Italy. Liguria occid. S. Remo, preso gli Ospedalenti, May, Panizz (FI); Sopra Monti Sterili in sassosso verso Porto fino Rapallo-Ruta, 7 Jul 1823, Figaro (FI); Bordighera, luoghi umidi, Jul, Ricca (FI); Sopra Monti Sterili in sassosso verso Porto fino Rapallo-Ruta, Italy

France. Lieux humides Aix, B. du Rho, 9 Jun 1867, Courciore (FI); Bords de la rivière à Riopar, 20 Jul 1850, Bourgeau 603 (FI); Bordes du lac de l’Albufera près de Valencia, 4 Jul 1852, Bourgeau 1582 (FI);

Spain. Environs de Cadiz, s.d., Fée (FI); Bordes de la rivière a Riopar, 20 Jul 1850, Bourgeau 603 (FI); Bordes du lac de l’Albufera près de Valencia, 4 Jul 1852, Bourgeau 1582 (FI); Costal de Fels (Barcelona), 30 May 1871, Compan (FI);

Hypericum pubescens Boiss.

Italy. Favignana, 14 Apr 1973, Brullo (CAT); Gorghi Tondi, Mazzara del Vallo, 27 Sep 1973, Brullo (CAT); Levanzo, 4 Jul 1982, Brullo (CAT); Favignana, 15 Jun 1983, Brullo (CAT).

References


IUCN 2001. The IUCN red list categories and criteria, ver. 3.1. – IUCN Species Survival Commission.

IUCN 2006. Guidelines for using the IUCN red list categories and criteria, ver. 6.1. – IUCN Species Survival Commission.

Moris, J. H. 1837. Flora Sardoa, seu historia plantarum in Sardino et adjacentibus insulis vel sponte nascentium vel ad utilisatem latius exculтарum. 1. – Ex Regio Thypographeo, Taurini.


