

STUDIES ON THE FLORA OF IRAN, FOUR NEW SPECIES AND A SHORT NOTE ON AN INTERESTING RUBIACEAE

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Four new species including *Atraphaxis intricata*, *Centaurea elymatica*, *Heliotropium shirazicum* and *Serratula calcarea* are described. Taxonomic characters for all described species and illustrations of the entire plants are given. A new collection of *Aichisonia rosea* are introduced.

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مطالعه‌ای در فلور ایران شامل چهار گونه جدید و معرفی یک گونه جالب از تیره Rubiaceae

ولی‌اله مظفریان

در جریان نام گذاری گیاهان جمع‌آوری شده بمنظور نگارش فلور ایران بزبان فارسی و تکمیل هرباریوم مرکزی ایران (TARI) چهار گونه جدید از جنس‌های *Atraphaxis*، *Centaurea*، *Heliotropium* و *Serratula* معرفی می‌گردد.

Introduction

Based on the new collections during the recent years from different parts of Iran in order to determine plant species in the tribe *Cynareae* (*Compositae*) and completion of the herbarium of Research Institute of Forests and Rangelands (TARI) among the collected materials 4 species new to science were discovered which are described here, for determination of collected material beside the K.H. Rechinger Flora Iranica (Riedl 1967), (Rechinger & Schiman-Czeika 1968), (Rechinger 1980), (Schiman-Ceika & Ehrendorfer 2005), Akhani, H. & Forther, H. (1994) and Boissier (1975) most of the Floras of neighbouring countries including Davis (1975), Bobrov E. G. and Cherepanov S. K. (1963), Pavlov. N. V. (1936), Schishkin B. K. and Bobrov E. G. (1962), Takhtajan (1995) were studied.

***Atraphaxis intricata* Mozaff., sp. nov.** –Fig. 1.

Frutex 10-30 cm altus. Caules crassi, dense ramosissimi, intricati ± rigidi, lignosi, dense foliati. Rami ± flexuosi, internodiis usque ad 4-5 mm longis, cortice atrogrieseo ± rimoso. Rami annotini ± erecti, valdi, ± dense foliati, inermes, mox lignescentes, acuminati, albi, glabri; ochreae ramularum ± 1-2 mm longae, cylindratae, internodiis breviores, dilute brunneae, dentibus lateralibus 2. Folia dilute viridia, 2-5 mm longa, 1.5-3 mm lata, coriacea, rhomboidea, ovato-cuneata vel orbicularia, basin versus decurrentia, revolute marginata, glabra, subtus prominente nervosa. Flores 1-3, axillares, ad ramulo fasciculati; pedicelli longi, infra medium articulati, segmentis perianthi

albis, purpureis vel atropurpureis, fere magnis; segmenta interiora ad fructificationis tempore inequalia, orbicularia, nervosa, ad apices plicata, achenia obteata; segmenta exteriora minora, orbicularia, reflexa. Achenia trigono-ovato-orbicularia, dilute brunnea, glabra, lucida.

Holotypus. Khorassan: Bujnurd, ca. 20 km from diviation of Raz-Bujnurd road to Raz, 1650 m, 5.6.2003, V. Mozaffarian 83695. (Holotypus TARI).

The new species differs from *A. spinosa* in having trigonous achene and 5 perianth segments and with *A. pungens* in having axillary fruiting branches and not terminal racemes.

Shrub 10-30 cm high; stem thick (stout); branches dense, intricate, ± rigid, woody, leafy throughout, without spiny tip, covered with greyish-dark rough bark; current year's branches ± straight stoutish, terminated to small leaf, soon becoming lignified, acuminate, whitish, glabrous; ocrea short-cylindric, 1-2mm long, shorter than internodes, pale brownish, with 2 lateral teeth. Leaves bright green, 2-5 mm long, and 1.5-3 mm broad, coriaceous, rhomboid, ovate-cuneate, or orbicular, decurrent towards the base, sessile, with slightly revolute margins, quite glabrous, with prominent midrib beneath. Flowers 1-3 in axillary fascicles on short branchlets; pedicels long, joined below the middle; perianth segments white, pink to deep red, rather large, inner segments of fruiting perianth slightly unequal, orbicular, veined, folded

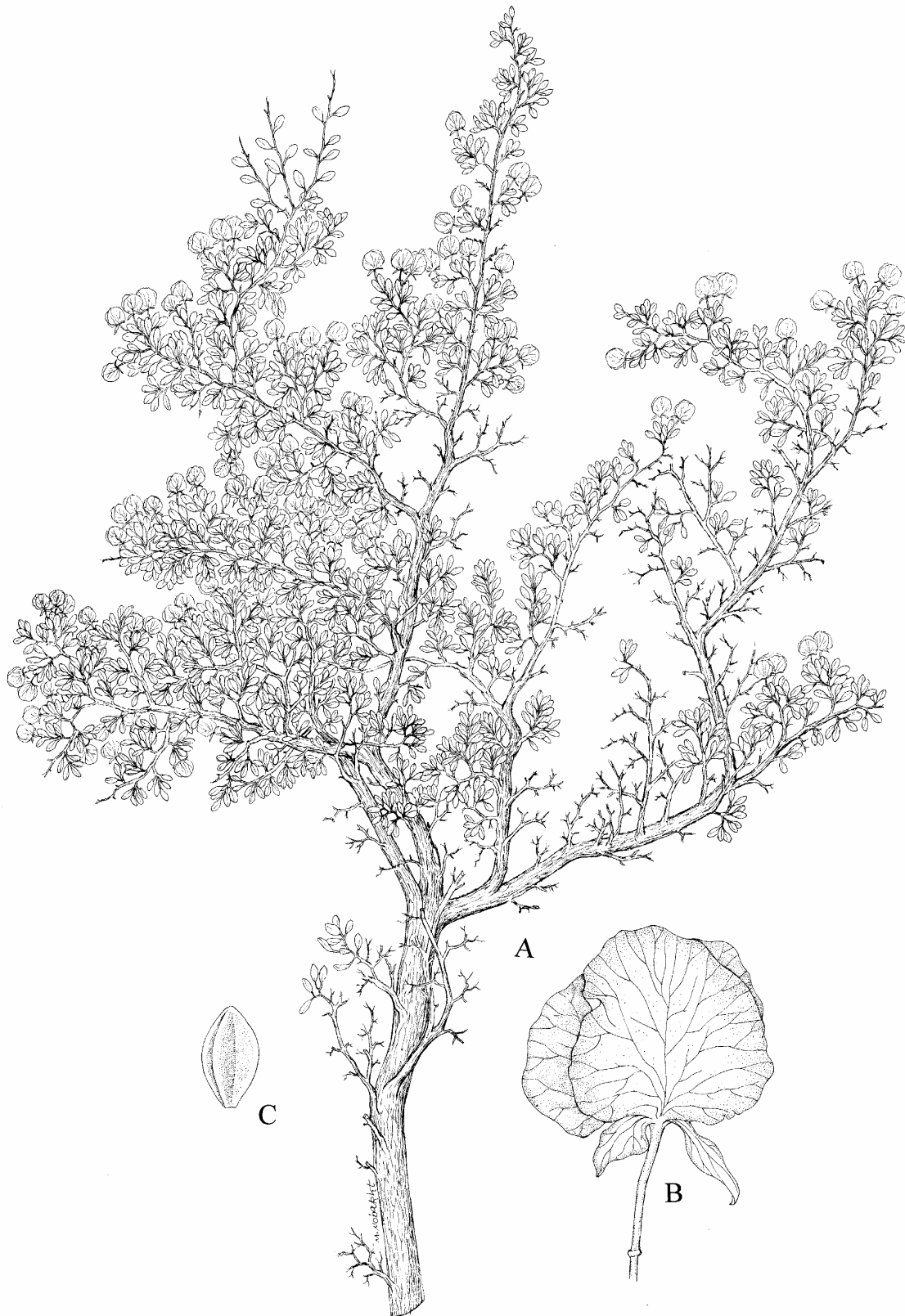


Fig. 1. *Atraphaxis intricata*. –A. a branch (x 0.72); B. perianth segments (x 2); C. achene (x 2).

above, covers the achenes, outer segments small, orbicular, reflexed. Achenes trigonous-ovate-orbicular, pale brown, glabrous and smooth, shiny.

Distribution. Endemic

***Centaurea elymaitica* Mozaff., sp. nov.** –Fig. 2.

Planta perennis. Caulis erectus, glaber, 50-70 cm altus, in parte superiore iteratim dichotomo-ramosus. Capitula corymbosa, laxa vel subdensa. Folia firma, nervis prominentibus, glabra vel in pagina inferiora pilis glandulosis sessilibus sparse obsitis; folia basalia petiolata, permagna, usque ad 15-16 cm lata et 30 cm longa, late ovata, integra, ± undulata, berviter oblique decurrentia; folia caulina inferiora basalia similia sed sessilia, manifeste late decurrentia; folia ramealia abrupte decrescentia, oblongo-lanceolata vel lanceolata, manifeste decurrentia; capitula in apice ramorum solitaria. Involucrum ad 20×12 mm, apicem versus angustatum; phylla 4-6 seriata, rigide coriacea, laevia, glabra; appendices coriaceae, stramineae, triangulares, 4-10 mm longae et ciliis exclusis ca. 2-3 mm latae, sensim in spinam 2-5 mm longam angustatae; ciliis utrinque numero 5-6 ornatae. Flores lutei. Achenia 4.5-6 mm longa; pappus 4-6 mm longus, setae serie intimae ceteris breviores.

Holotypus: Elam, Chenarbashi, old road to Darre Shahr, close to Khoshghadam village, protected forest. 1132 m, N 33°, 26'; E. 46°, 51', Mozaffarian 86999 (TARI).

Plant perennial, Stems erect, glabrous 50-70 cm high, in upper part dichotomously branched, with loose or nearly dense corymbose capitula. Leaves coriaceous, with prominent nerves, glabrous or in lower surface loosely covered by sessile glandulose hairs. Lower stem leaves similar to basal ones but without petiole, prominently decurrent; leaves of branches abruptly reduced, oblong-lanceolate or lanceolate, manifestly decurrent. Capitula usually solitary at apex of branches. Involucre up to 20×12 mm, towards the apex narrowed; phyllaries 4-6 rows, coriaceous, smooth, glabrous; appendages small, leathery, straw-coloured, triangular, 4-10 mm long, without cilia up to 2-3 mm broad, gradually narrowed to up to 2-5 mm long spine; cilia on both sides 5-6 in number. Flowers yellow. Achene 4.5-6 mm long; pappus up to 4-6 mm long; inner series shorter than outer ones.

Centaurea elymaitica is in habitat similar to *Centaurea behen* L. but phyllaries in *C. behen* are not appendiculate and by having appendiculate phyllaries similar to *Centaurea gudrunensis* Boiss. & Hausskn, but leaves in *C. gudrunensis* are pinnatipartite or nearly lyrate.

***Heliotropium shirazicum* Mozaff., sp. nov.** –Fig. 3.

Perenne herbaceum, multicaule, 25-35 cm altum, canescens, ad basin ramosum. Indumentum appressum

vel longe villosum. Folia 15-30 mm longa, 5-15 mm lata, elliptica vel lanceolato-oblonga, acuta, ad basin attenuata vel late ovata, margine revoluta, integra, supra appresse tomentosa et glanduloso-punctata, nervis supra impressis, subuts distincte prominentibus, dense tomentosa. Inflorescentiae fere terminales, ramosae, ± erectae; cymae ad 4-12 cm longae, uniseriatae, unilaterales, dense vel laxe 5-12 florales; flores sessiles vel inferiores ad 1 cm longe pedicellati. Calycis lacinae triangularo-ovatae, acutae, ad 4 mm longae, villosae. Corolla ad 8 mm longa, lobis triangularo-lanceolatis, undulato-marginatis, Anthera 2 mm longa. Stigma 2 mm longum, elongato-conicum, laxissime sericeum. Stylus ca 1 mm longus, glaber. Nuculae immaturae ± hispidae.

H. shirazicum is a sandy area growing species, it is unique by the bushy form habitat and densely leafy branches and dense to loose terminal inflorescence cymes.

Holotypus: Fars: Kharame, Bakhtegan, Chahrig, 1450 m, 24.5.2002, V. Mozaffarian 81064, 83611 (Holotypus TARI)

Herbaceous perennial, many-stemmed, 25-35 cm high, greyish, branched from base, covered by appressed and long villose hairs. Leaves 15-30 mm long, 5-15 mm broad, elliptic, lanceolate-oblong, acute, attenuate to broadly ovate at base, with thickened margins, revolute, entire; upper side appressed tomentose mixed with sessile glandular dotted hairs, impressed along nerves; lower side covered by dense tomentose hairs, with distinct nerves. Inflorescence mainly terminal, branched, ± erect; cymes up to 4-12 cm long, uniseriate, unilateral, dense to loose, with 5-12 sessile flowers, rarely lower ones with up to 1 mm long pedicels. Calyx lobes up to 4 mm long, triangular-ovate, acute, outside villose, inside ± glabrous. Corolla up to 8 mm long, outside appressed villose, only at the top of teeth glabrous; corolla lobes triangular-lanceolate with undulate margins. Anthers 2 mm long, inserted at 2 mm above the corolla base. Stigma up to 2 mm long, elongated conical, sparsely hairy above the middle; style ca. 1 mm long, glabrous. Immature nutlets ± hairy.

Distribution. Endemic

***Serratula calcarea* Mozaff., sp. nov.** –Fig. 4.

Planta perennis, glaberrima, multicaulis. Caulis 50-60 cm altus, saepius profunde paucifurcato-ramosus, foliatus, divaricatus vel ascendens, basi violaceus, supra tenuiter albo-costatus, pallide viridis, remote foliatus, superne longe nudus. Folia omnia consistentia rigide coriaceo-membrancea, basalia integerrima vel remote cartilagineo-dentata, plana, petiolata; lamina



Fig. 2. *Centaurea elymaitica* (x 0.48).



Fig. 3. *Heliotropium shirazicum*. –A. habit (x 0.77); B. flower, C. calyx and stigma and D. calyx (x 3).



Fig. 4. *Serratula calcarea* (x 0.5).

lanceolato-oblonga, 15×3 cm, glabra, in petiolum attenuata, apice acuta vel obtusiuscula; folia caulina inferiora sessilia vel breviter petiolata; lamina ambitu lanceolato-oblonga vel triangularia, acuta usque ad

12×5 cm, cartilagineo-dentata; folia caulina media sessilia; folia summa valde diminuta, lanceolata, sessilia vel ad basi breviter decurrentia, apice acuminata. Capitula in ramis solitaria, terminalia; involucreum 20-30 mm longum, campanulatum, viride, glabrum; phylla ± 5-6 seriata, regulariter arcte imbricata, ad extimis breviter ovatis, sensim acuta, in spinulam terminalem rigidulam 0.5-1 mm longam contracta; phylla intima pallide straminea, longe exserta; corolla in vivo alba, in sicco flava, ± 22 mm longa; tubus limbum subaequans; laciniae ± 5 mm longae. Achenium 5 mm longum; striato-costatum, glabrum; pappus ± 8-9 mm longus breviter plumosus; radii intimi a ceteris non diversi.

Holotypus: Azerbaijan; Zanjan to Mianeh, around Nikpay village, close to Edalu, N. 36°, 55'; E. 48°, 07', 1400 m, V. Mozaffarian 87130 (TARI).

Plant perennial, glabrous, many-stemmed; stem 50-60 cm high, often furcately few branched, leafy, divaricate or ascending, thinly white striate, pale green, loosely leafy, long in upper part leafless. All leaves rigid coriaceous membranaceous; basal leaves entire or loosely cartilagineous dentate, plane, petiolate; blade lanceolate-oblong, 15×3 cm, glabrous, towards the petiole attenuate, acute or shortly petiolate; blade in outline lanceolate-oblong or triangular acute, up to 12×5 cm, cartilagineously dentate; median cauline leaves sessile; upper cauline leaves reduced, lanceolate, sessile or shortly decurrent, acuminate. Capitula on each branch solitary, borne on long leafless peduncles; involucre 20-30 mm long, campanulate, green, glabrous; phyllaries ± 5-6 seriate, regularly appressed imbricate; outermost one shortly ovate, gradually acute, narrowed to 0.5-1 mm terminal rigid spine; inner ones pale straw-coloured, long exserted; flowers white, in dry state yellow, ± 22 mm long; tube ± equaling the blade; blade ± 5 mm long, Achenes 5 mm long, striate-costate, glabrous; pappus of barbellate or plumose hairs; ± 8-9 mm long, innermost series not longer than the others.

Serratula calcarea by having lanceolate-oblong basal leaves are similar to *Serratula latifolia* Boiss. But by having non decurrent cauline leaves is different from it, by having small or medium sized capitula similar to *S. coriacea* Fisch. & C. A. Mey. and *S. grandifolia* P. H. Davis which is different from them in shape of basal leaves, size of capitula and type of branches and synflorescens.

***Aitchisonia rosea* Hemsl. ex Aitch. –Fig. 5.**

The type locality of *Aitchisonia rosea* is form Pakistan: Kurram which has been collected by Aitchison in 1882 and recently (1973) Sojak has collected this nice and interesting bushy to shrubby plant from Mian Jangal in Fars province.

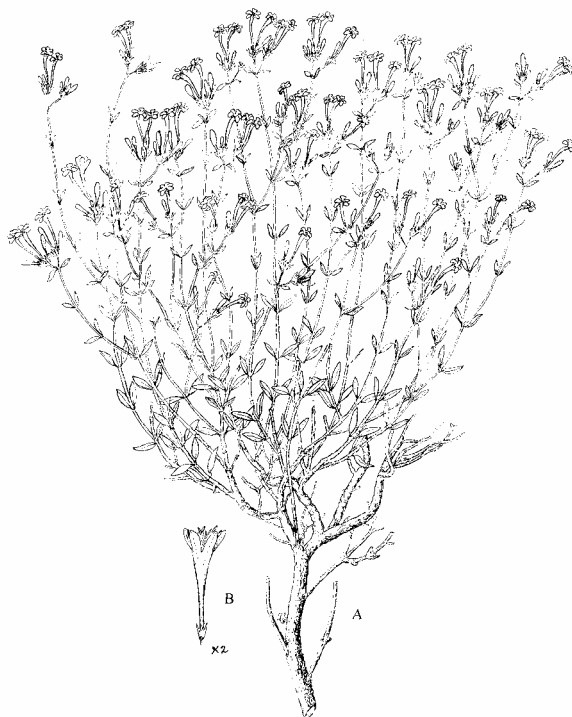


Fig. 5. *Aitchisonia rosea*. –A. a branch (x 0.68); B. flower (x 1.4).

The author on 1985 and 2003 with rich collection from Hormozgan and Fars province has found a good knowledge about distribution pattern of this curious species. More information about distribution of the plant in Iran is given.

Fars: Mian Jangal protected area, Tange Ahram, 1900-2000 m, 27.4.2003, V. Mozaffarian 83635 (TARI); Mian Jangal protected area, kuh-e Ahram, Tange Ahram, 1950 m, V. Mozaffarian 83561 (TARI), flowering specimen; 10 km S. E. of Sarvestan, post-e Chenar region (YN2) 1700-2200 m. V. Mozaffarian 46762 (TARI), (fruiting specimen): shrubby calcareous Rocky Mountains. -Hormozgan: Bandar Abbas, Bokhon, Tashgerd and Boneh Mountains, 1800-2700 m, V. Mozaffarian 52400 (TARI), fruiting specimen, *Amygdalus scoparia* forests and rich pasture at the top.

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