

TABLE 1.

Diagnostic characters of 'tournefortii' and 'purpurascens'

	'tournefortii' (<i>G. tournefortii</i>)	'purpurascens' (<i>G. rosea</i>)
Corolla	Bright to light yellow inside, rusty brown or sometimes purple outside	Bright to light pink inside, never yellow, deep purple outside, never rusty brown
Exposed parts of anterior capitular bracts	Usually green, sometimes purple	Purple
Fruit shape (Fig. 2)	Obconical, sometimes longitudinally furrowed, usually \pm polygonal in TS	Obovoid, never longitudinally furrowed, always round in TS
Fruit colour (when dry)	Pale to dirty brown	Whitish
Fruit length	Usually 1.0–1.5 cm	Usually 1.5–2.0 cm
Fruit wt*	Usually 0.1–0.3 g	Usually 0.3–0.6 g
Kernel wt*	0.06–0.1 g	0.09–0.15 g
Cotyledons	Usually 1.0–6.0 \times 0.5–0.9(–1.2) cm	Usually 0.2–1.0(–1.5) \times 0.7–1.2(–1.4) cm

*Obtained from 25 fruits and their kernels of each type of plant

abundantly in spring. They are particularly luxuriant in cultivated and fallow lands and are a common noxious weed in barley and cornfields.

The 'purpurascens' plants, on the other hand, are not so ubiquitous. They have been encountered so far only in three areas: around Atrush (c.800 m), Aqra (c.800 m) and Shaqlawa (900 m) respectively (see map, fig. 1). Near Atrush, these plants grow mainly in the pine woodland on red rocky soil. Between Aqra and Gullyzanta, on the other hand, they occur on small exposed hills, although the soil here too is rather red and rocky. Although it has not been possible to explore more localities in the northern mountains, it seems possible that 'purpurascens' is more widespread in this region than appears at present. It may also be that the gundelias in the higher altitudes of the adjacent mountains of E Turkey and NW Iran belong to 'purpurascens' group.

Near Aqra and near Atrush populations of the two kinds of plants occur in close proximity, but neither in these localities nor elsewhere are there any signs of hybridization in the form of plants of intermediate morphology. This suggests that a reproductive barrier may be operative which together with the morphological, habitat and distributional differences gives a strong case for recognizing 'tournefortii' and 'purpurascens' as separate species. Accordingly the 'purpurascens' plants are described here as *Gundelia rosea*.

Gundelia rosea Hossain & Al-Taey, **sp. nov.** Figs 1 & 2.

Syn.: *Gundelia tournefortii* var. β L., Sp. Pl. 814 (1753).

G. tournefortii L. f. *purpurascens* Bornm. in Beih. Bot. Centralbl. 60 B:197 (1939).

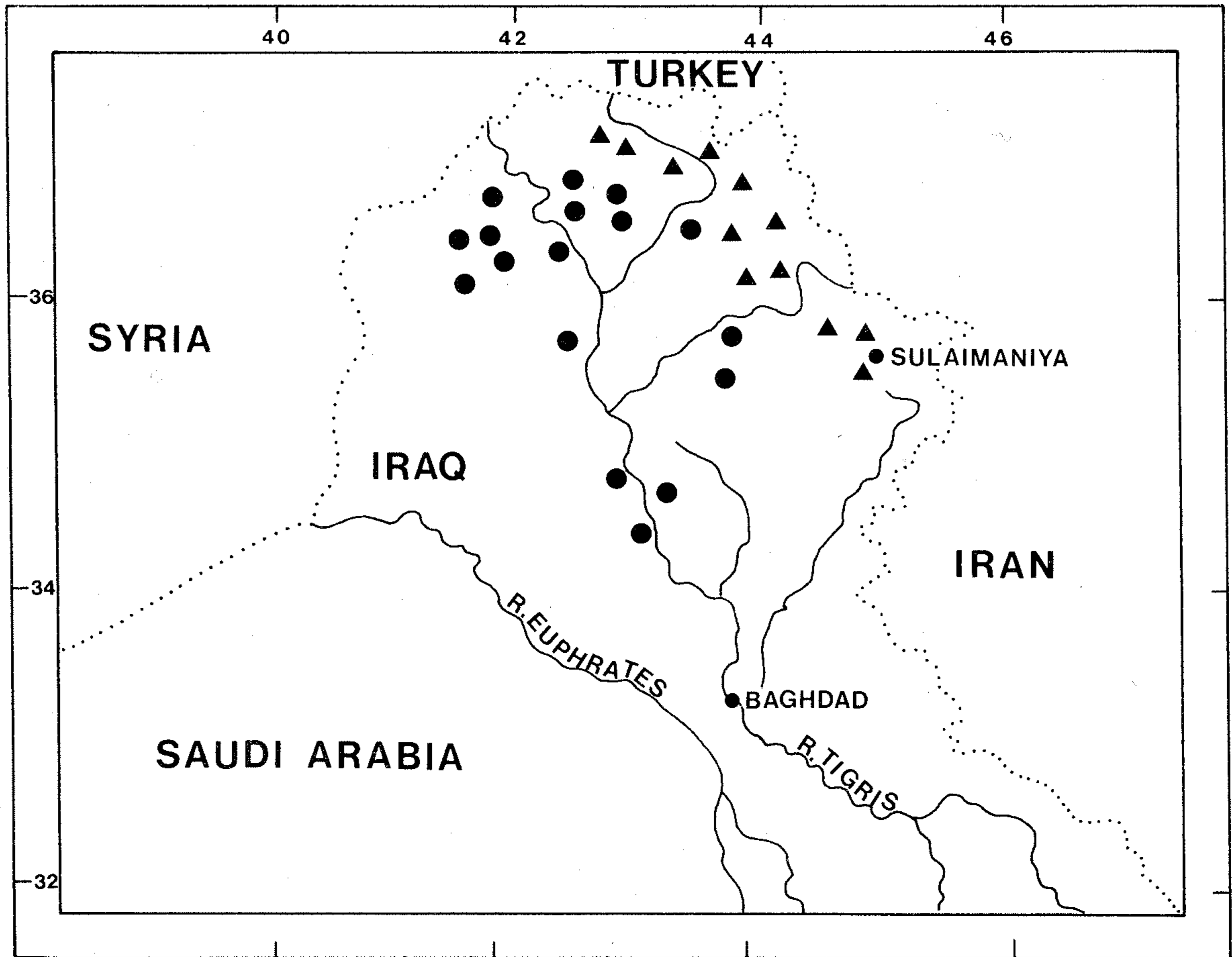


FIG. 1. Map of Iraq showing distributions of ● *Gundelia tournefortii* ('tournefortii'), and ▲ *G. rosea* ('purpurascens').

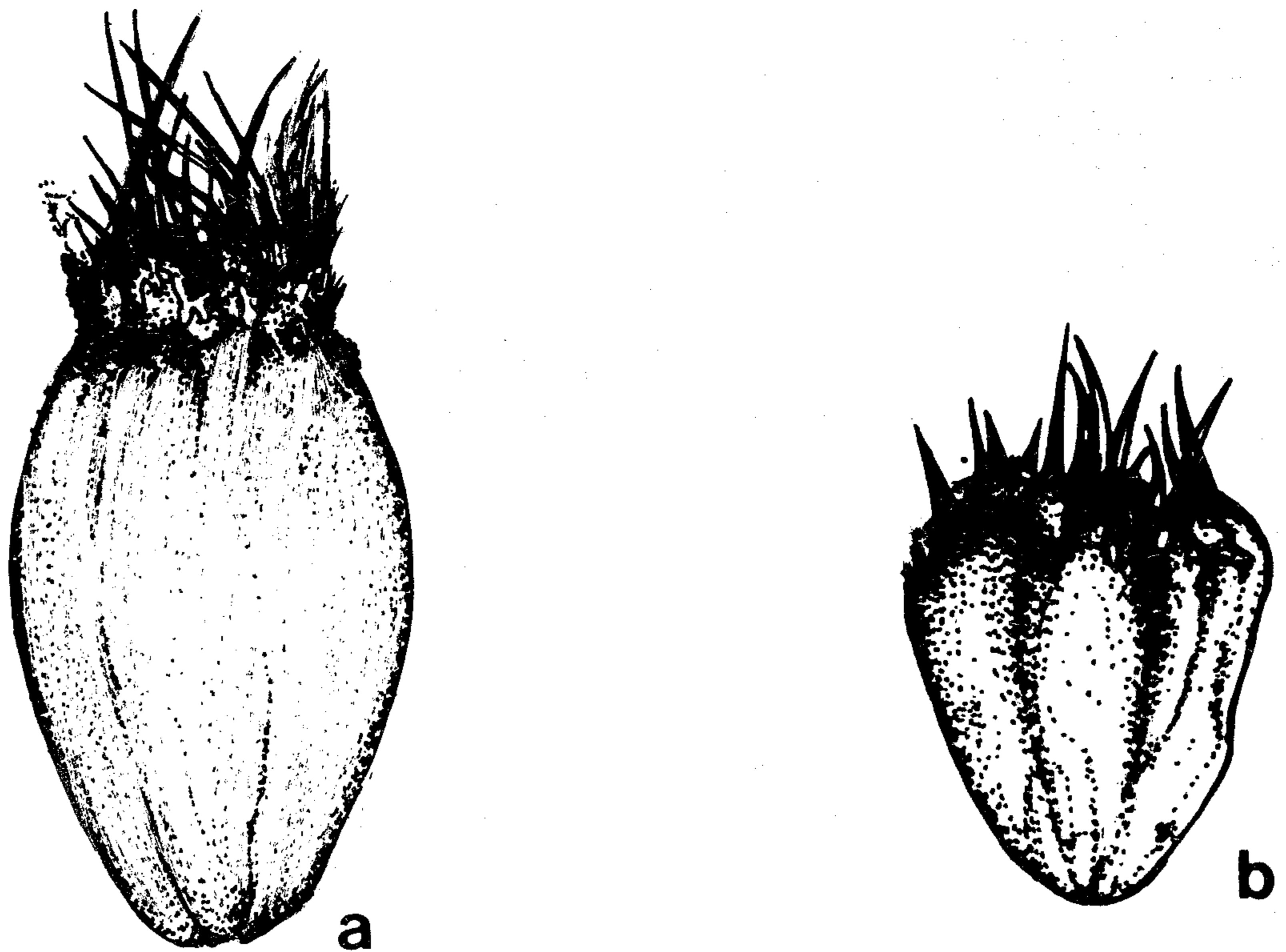


FIG. 2. Fruits of (a) *Gundelia rosea* ('purpurascens'), and (b) *G. tournefortii* ('tournefortii').

[*G. purpurascens* Bornm. fide Index Kewensis Suppl. 10:102 (1947) & in Al-Rawi, Wild Plants of Iraq (1968)—nom. inval.]

Affinis *G. tournefortii* L. sed corolla extus intense purpurea intus rosea haud flava, fructibus majoribus obovoideis nec obconicis differt.

Herba perennis 30–65 cm alta, latices copioso albo. Caulis flexuosus erectus ramosus, 1.5–2.5(–2.8) cm diam., pallide viridis, inferne glaber superne pilis araneosis vel moniliformibus obsitus. Folia simplicia alternata estipulata, superficiebus ambabus \pm similaribus manifeste purpurea vel viridi-nervosis coriacea. Folia basalia prostrata longe petiolata ambitu \pm oblanceolata, pinnatipartita vel \pm pinnatisecta, lobis terminalibus et lateralibus pungentibus et aculeatis; folia superiora minora sessilia manifeste decurrentia, dentata vel pinnatifida, marginibus aculeatis et lobis lateralibus pungentibus. Flores (unusquisque est unum capitulum) in capitula 5–8(–11)-flora heterogama aggregati superne discreti et inferne connati. Capitula 12–45(–50) in glomerulos compactos terminales ovoideos vel \pm oblongos 7–10 \times 5–6 cm (spinis inclusis) agglomerata, omnia bracteis 4 (bractea antica bracteis posticis et lateralibus longiora) rigidis liberis superne intense purpureis pungentibus inferne incoloratis \pm carinatis subtenta. Flos centralis capituli hermaphroditus 15–19 mm longus, corolla actinomorpha 16–18 mm longa, 5-fida, \pm infundibuliformis, extus intense purpurea et intus rosea haud flava. Stamina 5, inferne corollae adnata superne libera, antheris paulo connatis, ad basin hastatis sine caudis obtusis vel truncatis, granis pollinis tricolpatis sphericis spinosis. Ovarium receptaculo liberum, c. 0.5 \times 0.3 mm, obovoideum, pappo denticulato c. 2 mm longo coronatum. Stylus simplex glaber. Stigma stylo paulo crassiore, c. 6 mm longum, clavatum extus papillosum superne lobis divergentibus crispis c. 3 mm longis bilobatum. Achenia in cavum induratum receptaculi inclusa, distincte obovoidea nec obconica, albo-grisea, 15–20 \times 10–14 mm. Flores peripherales capituli masculini praeter ovarium abortivum florem centrale hermaphroditum omnino similes. Fl. Mai.–Jun. $2n = 18$.

IRAQ: North of Atrush, c. 60 km NE of Mosul, pine woodland, perennial herb with petals purple outside and pink inside, c. 900 m, 10 v 1978, *Mosharraf Hossain* (holotype Biol. Dept. Herb., Univ. Mosul; iso. BAG, E, K); N Iraq, c. 2 km N of Zawita, grassy mountain-slope, perennial herb with petals purple outside and pink inside, c. 800 m, 10 v 1978, *Mosharraf Hossain*; nr. Koi-Sanjak, E of Erbil, grassy mountain-slope, perennial herb with petals purple outside and pink inside, c. 900 m, 12 iv 1978, *Mosharraf Hossain*.

CYTOLOGY

Chromosome counts of $2n = 18$ were obtained for root-tips of both *Gundelia rosea* and *G. tournefortii*. The root-tips were pretreated with 0.1% colchicine solution for one hour, fixed in 3:1 alcohol: acetic acid for one and a half hours, hydrolysed in N HCl at 60°C for 15–20 minutes, stained in Schiff's reagent for one hour, washed in distilled water for one hour and then squashed on a slide in 45% acetic acid with a drop of acetocarmine.

A difference in size between the chromosomes of the two species was observed: 6–14 μm in *G. rosea* and 4–10 μm in *G. tournefortii*. Whether

this difference is significant or is merely the result of chance variations in pretreatment, or other technique, is not known. Most chromosomes in *G. rosea*, and probably in *G. tournefortii*, are metacentric.

Our chromosome count of $2n=18$ for *G. tournefortii* agrees with the count by Waisel (1962) of $n=9$ from pollen mother cells of specimens from Palestine.

REFERENCES

- AL-RAWI, ALI (1968). *Wild plants of Iraq*. Technical Bulletin No. 14, Ministry of Agriculture, Baghdad, Iraq.
- WAISEL, Y. (1962). Ecotypic differentiation in the Flora of Palestine. *Bull. Res. Council. Palestine* 11D(3):174-176.