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A new species of *Alchemilla* (Rosaceae) from Turkey

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A new species, *Alchemilla trabzonica* Hayırlıoğlu-Ayaz & Beyazoğlu (Rosaceae) is described for the Turkish flora. The chief characters of *A. trabzonica* are appressed-hairy stems and petioles, pedicels appressed-hairy throughout, epicalyx lobes sparsely hairy and sinus open.

Key words: *Alchemilla*, new species, Rosaceae, taxonomy, Turkey

The genus *Alchemilla* L. of the Rosaceae includes more than 1 000 species, which have a holarctic distribution. The genus also occurs on mountains of eastern Africa, from Abyssinia to the Cape of Good Hope, in Madagaskar, South India, Sri Lanka and Java (Izmailow 1981).

According to the records in the flora of Turkey, all *Alchemilla* species in Turkey belong to the section *Alchemilla*. It is composed of 3 subsections and 6 series with 50 species (Davis 1972). In a more recent study, Kalheber (1994) has described 6 new species for the flora of Turkey. In this paper, we describe a further new species. This species, which belongs to the subsection *Calycanthum* and series *Elatae*, was collected from Zigana Pass in the Vilayet Trabzon. We are presenting a general key to the species of Turkish *Alchemilla* including the new species. The key mainly follows that provided by Kalheber (1994).

Key to the Turkish species of *Alchemilla*

1. Leaves divided to base or nearly so 2
— Leaves lobed to 1/2(2/3) at most 4
2. Leaf segments with apical teeth up to 2 mm ..... *A. plicatula*
— Leaf segments with deeply serrate or ± lobed apices 3
3. All leaf segments completely free, often the outer 2 on each side of the leaf fused for up to 1/5 of their length ..... *A. sericea*
— Only the middle leaf segments free, the outer all (normally 3) fused up to 1/10–1/5 up their length ..... *A. rizensis*
4. Sepals as long as or shorter than the more or less campanulate hypanthium; epicalyx lobes mostly shorter than sepals; achenes not or only slightly longer hypanthium 5
— When the seeds are ripe, sepals and achenes distinctly longer than the conical hypanthium; epicalyx lobes as long as or longer than the sepals, very rarely shorter at anthesis 26
5. Whole plant, including all pedicels throughout all of their length, densely hairy 6
— Some parts of the plant or sometimes only parts of the upper surface of the leaf or distal part of some pedicels or hypanthia glabrous 10
6. At least some hairs on petioles and lower part of stem distinctly deflexed 7
— Hairs on stems and petioles patent, erecto-patent or appressed, after heavy rainfall patents hairs sometimes are a little bit deflexed or bent downwards 8
7. Leaf lobes more or less truncate, separated by obvious toothless incisions, teeth 4–5(6) ..... *A. erythropoda*

— Leaf lobes rounded or almost triangular, with very shallow toothless incisions between them, leaf teeth 6–7(8) ..... *A. lithophila*
8. Hairs usually appressed or subappressed, plant up to 30 cm ..... *A. sericata*
— Hairs erecto-patent or patent, plant up to 17 cm .. 9
9. All pedicels with a dense, erecto-patent pubescens ... . *A. caucasica*
— Some pedicels with only few erecto-patent hairs, the others with a dense indumentum of hairs of the same type ..... *A. plicatissima*
10. All hypanthia hairy 11
— All hypanthia glabrous or on the same plant some hypanthia glabrous and some hairy 20
11. Some pedicels hairy at least in part 12
— All pedicels glabrous 15
12. Upper surface of leaves sparsely or patchily hairy (sometimes only very few hairs in the folds or on the teeth of leaf; it is possible that the margin of the leaf is ciliate, but these hairs are not referred to here) ..... *A. surculosa*
— Upper leaf surface of the leaf densely and evenly hairy 13
13. Hairs on petioles and lower part of stems erecto-patent; dwarf plant up to 10 cm ..... *A. plicatissima*
— Hairs on petioles and lower part of stems patent or deflexed; medium-sized plant up to 20(–40) cm .. 14
14. Leaves orbicular, (7–)9 lobes; pedicels variably hairy ..... *A. valdehirsuta*
— Leaves reniform, 7 lobes; all pedicels hairy in proximal parts ..... *A. grossheimii*
15. Leaf lobes separated by deep toothless incisions; teeth longer than wide ..... *A. pectiniloba*
— Leaf lobes with small or no incision between them; teeth about as long as wide 16
16. Some hairs on stems and lower part of petioles deflexed 17
— All hairs on lower part of stems and petioles patent or erecto-patent 18
17. Leaves orbicular, sinus narrow, basal lobes touching, or overlapping ..... *A. compactilis*
— Leaves reniform, sinus open, basal lobes widely separated ..... *A. crinita*
18. Dwarf plant (less than 8 cm), leaves reniform with wide basal sinus ..... *A. microscopica*
— Medium-sized to tall plants, to 50 cm; leaves orbicular in outline with narrow or closed basal sinus 19
19. Hairs on petioles and stems erecto-patent; hypanthia densely hairy ..... *A. stevenii*
— Hairs on petioles and stems patent; hypanthia sparsely hairy ..... *A. monticola*
20. Lower part of stems and petioles of summer leaves with patent or deflexed hairs 23
— Stems and petioles either with appressed or subappressed hairs 21
21. Plant entirely glabrous except for sparse appressed hairs on distal half of main veins beneath leaves and a few cilia on leaf teeth ..... *A. straminea*
— Plant with appressed or subappressed hairs at least on petioles of summer leaves 22
22. Reniform and orbicular leaves present, both types with narrow or closed sinuses, teeth acute, equal size ..... *A. minusculiflora*
— Leaves reniform with wide basal sinus, teeth subacute or ± obtuse, unequal .... *A. pseudocartalinica*
23. Upper surface of leaves glabrous or with some hairs near the edge and on the teeth ..... *A. heterophylla*
— Upper surface of leaves with hairs at least in the folds 24
24. Petioles of spring leaves glabrous and those of summer leaves patent hairs, stems glabrous in upper half including complete inflorescence .... *A. oligotricha*
— All petioles hairy, stems hairy at least up to the second branch of inflorescence 25
25. Leaves orbicular with basal lobes touching or overlapping ..... *A. compactilis*
— Leaves reniform with wide open sinus, basal lobes widely separated ..... *A. crinita*
26. Stems and petioles with patent or erecto-patent hairs 27
— Stems and petioles glabrous or with appressed or subappressed hairs 47
27. All pedicels ± densely hairy 28
— All pedicels glabrous or some of them sparsely hairy in proximal part 31
28. Sepals and epicalyx lobes glabrous 29
— Sepals and epicalyx lobes sparsely hairy and sparsely ciliate 30
29. Stems, petioles and pedicels with erecto-patent hairs; leaf lobes with 5–8 subequal teeth ..... *A. orthotricha*
— Stems, petioles and pedicels with patent hairs; leaf lobes with 7–11 very unequal teeth ..... *A. erzincanensis*
30. Glomeruli dense, elongated up to 3× as long as broad; leaves with wide sinus ..... *A. orduensis*
— Glomeruli lax, short; leaves with narrow or closed sinus ..... *A. hirtipedicellata*
31. All leaves densely hairy on both surfaces 32
— At least upper surface of leaves not densely and evenly hairy 37
32. Leaves lobed to more than 1/3, with long toothless incisions, lobes parabolic to semielliptic .... *A. hemsinica*
— Leaves lobed only 1/10–1/6 or 1/7–1/4 33
33. Leaves lobed only 1/10–1/6, often very indistinctly lobed and with overlapping basal lobes .. *A. holocycla*
— Leaves lobed to 1/7–1/4, always with distinct lobes 34
34. Flowers 3.5–5 mm wide, all or almost all pedicels glabrous (sometimes 1 or 2 in each glomerulus with few hairs in any part 35
— Flowers 4.5–6.5 mm wide, lower pedicels in each glomerulus sparsely hairy below . *A. porrectidens*
35. Stems hairy almost throughout, at least 5/6 their length,

leaves with narrow or closed sinus 36
— Stems glabrous in their upper 1/4–1/3, leaves with rather wide sinus ..... *A. amoena*
36. Leaf lobes not truncate, with no incisions; teeth 6–10 ..... *A. mollis*
— Leaf lobes truncate, with short but distinct incisions; teeth 3–5(–6) ..... *A. bornmuelleri*
37. At least some hypanthia ± hairy 38
— All hypanthia glabrous 45
38. Upper surface of at least some leaves hairy, at least in the folds 39
— Upper surface of all leaves glabrous and densely hairy beneath on the whole surface, hairy on veins only 42
39. Leaf lobes arcuate, semiorbicular or semielliptic .. 40
— Leaf lobes at least partly subtriangular 41
40. Stems hairy almost throughout; leaf lobes without incisions ..... *A. persica*
— Stems glabrous in the upper 1/4–1/3; leaf lobes with short but distinct incisions ..... *A. oriturcica*
41. Stems hairy almost throughout; all leaves dispersed hairy above ..... *A. hirsutiflora*
— Stems glabrous in the upper 2/5; basal and lower cauline leaves ± glabrous above, remainder sparsely hairy above ..... *A. armeniaca*
42. All leaves divided to more than 1/3, reniform with wide open sinus, lobes long parabolic to semielliptic with long incisions ..... *A. cimilensis*
— Leaves not divided to more than 1/4 43
43. Leaves reniform, reniform to orbicular-reniform, sinus closed or open, glomeruli dense 44
— Leaves orbicular with narrow or closed sinus, glomeruli lax ..... *A. ikizdereensis*
44. Leaf lobes arcuate, semiorbicular or subtriangular, all leaves with open sinus ..... *A. bursensis*
— Leaf lobes rounded, semicircular or parabolic, sinus mostly closed but open in some leaves ..... *A. kaçkarensis*
45. Leaf lobes with short but distinct incisions, sinus narrow or closed ..... *A. elevitensis*
— Leaves without toothless incisions, with very narrow or wide sinus 46
46. Stems hairy almost throughout; leaves lobed to 1/4–1/3, with very narrow sinus ..... *A. sintenisii*
— Stems glabrous in the upper 1/2–1/4; leaves lobed to 1/8–1/5 with wide sinus ..... *A. hessii*
47. All hypanthia at least partly hairy 48
— All hypanthia glabrous 56
48. Leaves densely hairy on both surfaces 49
— Upper leaf surfaces glabrous or only sparsely hairy; all pedicels glabrous 50
49. Epicalyx lobes glabrous; the lower pedicels in each glomerulus with ± dense subappressed hairs in their proximal parts ..... *A. ziganadagensis*
— Epicalyx lobes sparsely hairy; all pedicels appressed hairy throughout ..... *A. trabzonica*
50. Leaves with hairs dispersed over the whole of the upper surface ..... *A. sciadiophylla*
— Upper surface of leaves glabrous or hairy only on the folds 51
51. Leaves very distinctly reniform 52
— Leaves suborbicular to orbicular-reniform with closed or open but not very wide sinus 53
52. Stems appressed hairy throughout; leaf lobes short, acute or triangular ..... *A. abchasica*
— Stems subappressed hairy in the lower 1/10–1/2, glabrous above, leaf lobes rounded-parabolic .... *A. buseriana*
53. All leaves with open sinuses, glabrous and sparsely hairy hypanthia on the same plant and normally in the same glomerulus ..... *A. stricta*
— At least some leaves with closed sinus, all hypanthia hairy at least at base 54
54. Stems rigid and ± robust, sparsely hairy in the lower 1/5–1/3, hypanthia hairy throughout .... *A. ciminensis*
— Stems slender, densely hairy at least to the first branch of the inflorescence, hypanthia hairy only in the lower half 55
55. Flowers 3–4.5(–5) mm wide ..... *A. barbatiflora*
— Flowers (4.5–)5–6.5 mm wide ..... *A. tiryalensis*
56. Leaf lobes rounded apex, without or with only shallow incisions 57
— Leaf lobes ± truncate separated by conspicuous incisions 59
57. Flowers 4.5–5.5 mm wide, leaves lobed to 2/5–1/2 .. .. *A. transcaucasica*
— Flowers small, 2–4(–4.5) mm wide 58
58. Leaves orbicular to orbicular-reniform with open but normally narrow sinus, flowers 2–3.5 mm ... . *A. procerrima*
— Leaves reniform with wide open sinus, flowers 3–4(–4.5) mm wide ..... *A. ancerensis*
59. Stems glabrous or sparsely hairy in the lower 1/3 .. 60
— Stems hairy up to the inflorescence, densely so below 61
60. Leaves lobed 1/4–3/7, with small teeth; cauline leaves small, distinctly lobed ..... *A. retinervis*
— Leaves lobed to 1/5–1/3 with fairly large teeth; cauline leaves large, only shallowly lobed .... *A. dura*
61. Leaves densely appressed hairy beneath on the entire surface ..... *A. venosa*
— Leaves appressed hairy beneath only on the veins and often above on the basal lobes ..... *A. ellenbergiana*

Alchemilla trabzonica Hayırlıoğlu-Ayaz & Beyazoğlu, *sp. nova* (Figs. 1 and 2)

Caules 30–45 cm alti, robusti, erecti-ascentes, ubique dense adpresse pilosi. Foliorum radicalium petioli ad 14–21 cm longi, dense adpresse pilosi. Laminae reniformes ad 6.2 × 9.9 cm, sinu

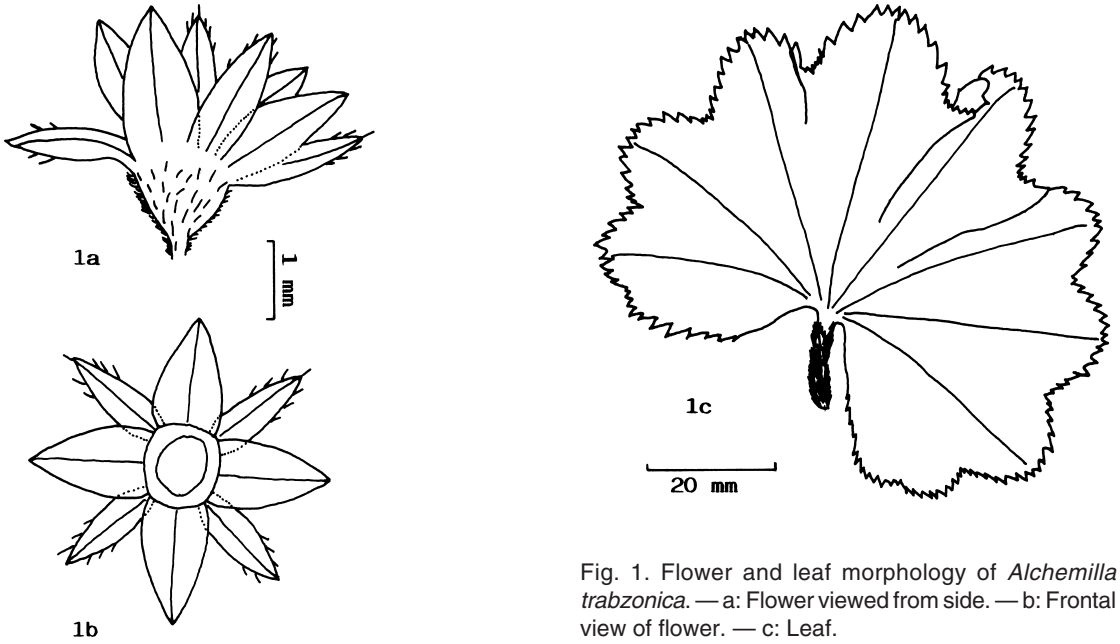

Fig. 1. Flower and leaf morphology of *Alchemilla trabzonica*. — a: Flower viewed from side. — b: Frontal view of flower. — c: Leaf.

basali lato, utrique dense pilosae. Inflorescentia angusta; glomeruli ± laxi. Pedicelli adpresse pilosi. Flores flavescentes, (4–)4.5–5 mm lati; hypanthia ± dense subadpresse pilosa. Sepala ovata, hypanthio longiora, episepala angustiores sed eis aequlonga vel breviora, pilosa.

Holotype: Turkey A7. Trabzon: Zigana Pass, S and SW meadows, by streamside banks (together with some species of *Rhododendron*, among others), 1 750 m, 20.VI.1995, *Hayırlıoğlu-Ayaz 190* (KTÜB).

Stems 30–45 cm, robust, erect-ascending, densely appressed hairy throughout most of their length. Leaves glaucous-green, reniform, up to 6.2 × 9.9 cm, with wide, open sinus, densely hairy on both surfaces, lobed to 1/6–1/4; without toothless incisions; lobes 9–11, semicircular or subtriangular, teeth 8–10, rather large acute, unequal and irregular, subconnivent, mammiliform, the apical as long as the adjacent teeth but narrow. Petioles of radical leaves 14–21 cm long, densely appressed hairy. Cauline leaves large, hairy on both surfaces, often 7-lobed. Inflorescence narrow, glomeruli ± lax; pedicels appressed hairy throughout. Flowers yellow, (4–)4.5–5 mm wide; hypanthia ± densely subappressed hairy. Sepals ovate, longer than hypanthia, epicalyx lobes narrow, as long as sepals or a little shorter and sparsely hairy.

The new species is similar to *Alchemilla ziganadagensis*, but differs in its appressed hairy stems and petioles, pedicels appressed hairy throughout, epicalyx lobes sparsely hairy and sinus open.

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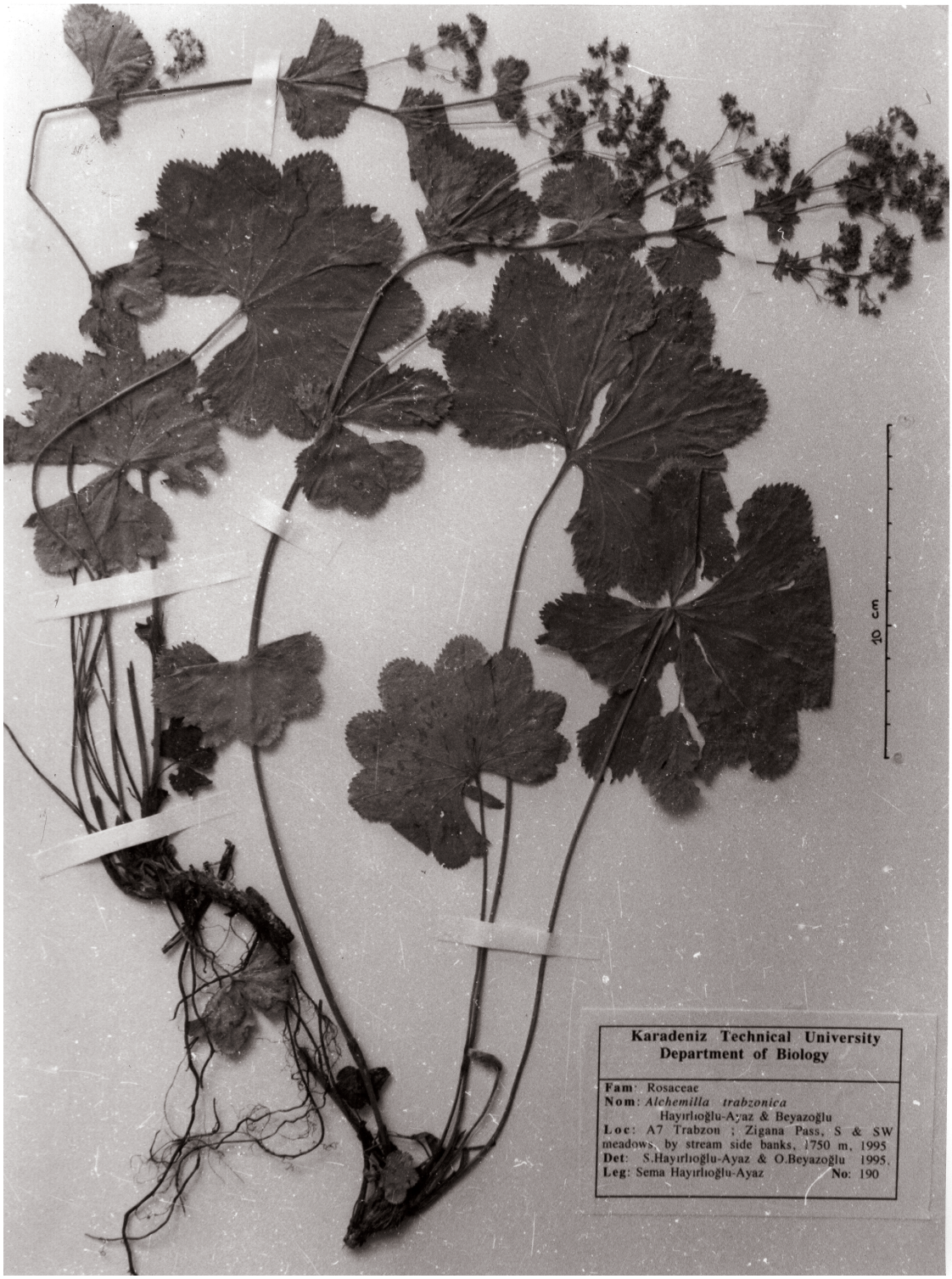

Fig. 2. *Alchemilla trabzonica*, photograph of holotype.