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

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A new species, *Alchemilla trabzonica* Hayırhoğlu-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 1000 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 ............
   — 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 ................................................................. 4. *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 patens 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*

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*A. plicatula*
— 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 pubescence ................................................................. 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 pathically 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. compactis
— Leaves reniform, sinus open, basal lobes widely separated ................................................. A. crinata
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 ................................ 23
........................................................................................................... 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. compactis
— Leaves reniform with wide open sinus, basal lobes widely separated ................................ A. crinata
26. Stems and petioles with patent or erecto-patent hairs .......................................................... 27
— Stems and petioles glabrous or with appressed or subappressed hairs .................................... 28
27. All pedicels ± densely hairy .................................. 28
— All pedicels glabrous or some of them sparsely hairy in proximal part .................................. 29
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 3x as long as broad; leaves with wide sinus ........ A. ordinensis
— Glomeruli lax, short; leaves with narrow or closed sinus .......................................................... 31
31. All leaves densely hairy on both surfaces ........ 32
— At least upper surface of leaves not densely and evenly hairy .................................................. 33
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. holocyclus
— 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. bornmuellerii
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, semiobtuse or semicircular ........ 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, leaves long parabolic to semilanceolate with long incisions ........................................ A. ciminensis
— 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. burserisens
— Leaf lobes rounded, semicircular or parabolic, sinus mostly closed but open in some leaves ................. A. kaçkârensis
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. sintensis
— 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 pedicles glabrous ......................... 50
49. Epicalyx lobes glabrous; the lower pedicles in each glomerulus with ± dense subappressed hairs in their proximal parts ........................................ A. ziganadagensis
— Epicalyx lobes sparsely hairy; all pedicles appressed hairy throughout ...................... A. trabzonica
50. Leaves with hairs dispersed over the whole of the upper surface ........................................ A. sciadophylla
— 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 appressed 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. cinimensis
— 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. tiryalesis
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 Hayirlioğlu-Ayaz & Beyazoğlu, sp. nova (Figs. 1 and 2)

Caules 30–45 cm alti, robusti, erecti-ascentes, ubique dense adpressae pilosi. Folium radicale petiolui ad 14–21 cm longi, dense adpressae pilosi. Laminae reniformes ad 6.2 × 9.9 cm, sinu
basali lato, utrique dense pilosae. Inflorescentia angusta; glomeruli ± laxi. Pedicelli adpressi pilosi. Flores flavescentes, (4–)4.5–5 mm lati; hypanthia ± dense subadpressa pilosa. Sepala ovata, hypanthio longiora, epispala angustiores sed eis aequalonga vel brevieria, pilosa.


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 zigananadagensis, but differs in its appressed hairy stems and petioles, pedicels appressed hairy throughout, epicalyx lobes sparsely hairy and sinus open.

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