

Beitr. Ent.	Berlin	ISSN 0005-805X
46(1996)1	S. 109-132	15.05.1996

On a collection of humble-bees from northern Iran

(Hymenoptera: Apoidea, Bombinae)

Mit 12 Figuren

DONALD B. BAKER

Abstract

A collection of *Bombus* and *Psithyrus* made in the Caspian provinces of northern Iran, chiefly Māzandarān, and in the central Alborz between 1965 and 1968 is recorded. Summaries of the temporal and spatial distributions of the species are given. The collection comprised 576 examples representing 19 species.

Additional key words: taxonomy, life zones, topography, biodiversity

Zusammenfassung

Eine Aufsammlung von *Bombus*- und *Psithyrus*-Arten in den Kaspischen Provinzen des Nordiran, hauptsächlich aus Māzandarān, und im zentralen Elbrus aus den Jahren 1965 bis 1968 wird vorgestellt. Zum zeitlichen und räumlichen Auftreten der Arten werden Übersichten gegeben. Die Kollektion umfaßt 576 Exemplare in 19 Arten.

Contents

Introduction	109
Localities in PITTIONI, 1937.	110
Localities in REINIG, 1939.	111
Collecting stations, 1965-1968	111
Life zones in the central Alborz	114
Topography	118
Species treatments	119
<i>Bombus</i>	119
<i>Psithyrus</i>	128
Comment	129
Acknowledgments	130
References	130

Introduction

PITTIONI (1937) and REINIG (1939) published short papers listing small collections of humble-bees made in the Alborz, northern Iran, by FRITZ WAGNER and - BRANDT (1936) and by E. PFEIFFER and W. FORSTER (1936-1937). SKORIKOV (1938, MS dated February 1936) published a short account of the geographical relationships of the north Iranian humble-bee fauna, which

he asserted to be essentially the same as that of Anatolia. He listed twenty species, including several not recorded by PITTIONI or REINIG, but gave no detailed records. POPOV (1967), in a general paper on Iranian bees, included lists of Iranian *Bombus* (pp. 210-211, based on PITTIONI's and SKORIKOV's papers) and *Psithyrus* (p. 214, based on PITTIONI's paper). He recorded no additional species. The present list is based on 576 examples referable to 19 species (*Bombus* 16, *Psithyrus* 3) collected in the Caspian provinces, chiefly Māzandarān, and in the Alborz ranges between 1965 and 1968. A part of this material was studied by the late Dr. I. H. H. YARROW in 1966, and in general his nomenclature has been followed.

Material recorded by PITTIONI and by REINIG has been taken into account wherever it adds materially to details of flight periods or altitudinal distribution. Some other published records have been ignored owing either to uncertainties as to locality or as to the reliability of determinations. The localities recorded by PITTIONI and REINIG, which do not follow standard transliterations from Farsi, and the altitudes recorded by them, which frequently appear exaggerated, require comment.

Localities in PITTIONI, 1937

- [P1] 'Straße Keredj-Mazanderan, (Nordhang des Gebirges), 1000 m': if the altitude is exact, BRANDT's locality was in the gorge of the Chālūs R., about 50-55 road km S of Chālūs on the Karaj road, $\approx$ BAKER [40], where there is sparse vegetation, including *Salix*, bordering the torrent and where herbs such as *Dionysia aretioides* (Lehm.) Boiss. cling to the rock face. More probably, BRANDT's collecting would have been done either where the Chālūs road descends from Wālīābād to the upper end of the gorge, $\approx$ BAKER [7] (brushwood zone, semidesert communities on steeper slopes), or below the gorge, near Dozd-e-Band.
- [P2] 'Nissa (zirka 3000 m) nordwestlich von Teheran': Nissā, in the Karaj valley, about 70 km from Karaj, at 2100 m. Collecting probably in the cultivation zone following the Karaj river. Semidesert. Near BAKER [10].
- [P3] 'Pelur (2000 m) nordöstlich von Teheran': Polūr, 2150 m, on the descent from the Imāmzādeh-ye-Hāshem pass to Āmol.
- [P4] 'Kendevan-Paß (3000 m) nordöstlich von Teheran': the ridge of the Alborz is pierced by the Kandavān tunnel at 2540 m (S end) - 2580 m (N end). Collecting is possible near either entrance: BAKER [49] is near the south entrance. The crest of the former pass was at about 2930 m.
Contrary to PITTIONI's opinion, [P1], [P2] and [P4] lie in one faunal area: semidesert, thorn-cushion, zone extending from about 1500 m on southern slopes of Alborz to montane brushwood zone of northern slopes.
- [P5] 'Rehne-Demavend (2700 m) nordöstlich von Teheran': Rīneh, on the descent from the Imāmzādeh-ye-Hāshem pass to Āmol, 20 km below Polūr [P3], at ca. 1600 m. [Between Polūr and Vānā the Āmol road, subject to frequent landslips, skirts the eastern flanks of Demāvend.] WAGNER's collecting was probably along the Qazānchāi (Sutton [n.d.], plate facing p. 5). Semidesert / thorn-cushion zone; cultivation in valley floor.

Localities in REINIG, 1939

- [R1] 'Sārdab-Tal (Tanakarud), 2900-3200 m': Tanakrūd, chaikhāneh on the upper Sardāb-Rūd, at ca. 3100 m.
- [R2] 'Sārdab-Tal (Vandarban), 2500-2700 m': Vanderabān, chaikhāneh on the upper Sardāb-Rūd, at ca. 2000 m. 'A grassy, flat space called Vanderaban' (STARK, 1934b: 250).
- [R3] 'Sārdab-Tal (Ḥasankif), 1000-1400 m': Hasankīf, a principal village of Kalār-Rustāq, lying in an intensively cultivated plain, ca. 1100 m.
- [R4] 'Hecarčal-Tal, 2800-3200 m': the Hazār-chāl ['thousand hollows'] pass, ca. 4000 m, is on a much-frequented track, skirting the Takht-e-Sulaimān massif (principal peak Ālam Kūh, 4850 m, in places with almost vertical walls of up to nearly 1000 m) on the south and east, between Kalār and Ṭāleqān. PFEIFFER's locality (1936) will probably have been on the approach to the pass from the north.
- [R5] 'Kendevan, 2800-3000 m': Kandavān pass, see [P4] above.

Collecting stations, 1965-1968

Only those stations at which *Bombus* and *Psithyrus* were collected are listed.

Stn No.	Altitude [m]	Life zone (see below)	Location. Vegetation (characteristic plants at dates of visits, or plants at which collections of insects were made: many plants collected for herbaria were either not named or were collected in localities other than those listed): botanical nomenclature is that of the <i>Flora Iranica</i> .
---------	--------------	-----------------------	--

Māzandarān

[1]			Coastal plain between <u>Chālūs</u> and <u>Shāhsavār</u> : a tract adjoining the Tīlrūd-sar (cf. RABINO, 1928: 26) preserving an unspoiled succession from shore to dense, high, deciduous (Hyrcanian) forest: -
	-20	I	Shore. <i>Achillea vernalis</i> Waldst. & Kit., <i>Convolvulus persicus</i> L., <i>Polygonum</i> sp.; <i>Suaeda</i> sp.
	< msl	II	Sand-stretch between shore and forest. Mosses and lichens, coarse grasses (<i>Imperata</i> , <i>Setaria</i>), sedges (<i>Cyperus esculentus</i> L.), scattered herbs (<i>Achillea vernalis</i> Waldst. & Kit., <i>Allium aucheri</i> Boiss., <i>Crepis foetida</i> L. subsp. <i>rhoeadifolia</i> (M. B.) Bobek / Schinz & Kell., <i>Eryngium caucasicum</i> Trautv., <i>Lithospermum officinale</i> L., <i>Lythrum salicaria</i> L., <i>Origanum vulgare</i>

L., *Petrorhagia saxifraga* (L.) Link., *Tribulus terrestris* L., *Trifolium arvense* L., *Verbascum punalense* Boiss. & Buhse, *Verbena officinalis* L.), nowhere forming a closed turf; scattered shrubs (*Mespilus germanica* L., *Paliurus spina-christi* Mill., *Prunus divaricata* Ledeb., *Punica granatum* L., a prostrate *Rubus*). Dividing the sand-stretch from the shore, a narrow tract of *Alnus subcordata* C.A. Mey. and *Pterocarya fraxinifolia* (Poirot) Spach with *Humulus*, *Rubus* (*sanctus* of Turrill, *hyrcanus* Juz. ?) and *Smilax* (*excelsa* L.).

- < msl III Woodland narrowly bordering high deciduous forest [Hyrcanian forest]. The woodland, and clearings in the forest, with many herbs (*Calamintha officinalis* Moench., *Calystegia silvestris* (Willd.) Roem. & Schult., *Cyclamen coum* Miller subsp. *caucasicum* (K. Koch) O. Schwarz, *Gynandriris sisyrinchium* (L.) Parl., *Lamium album* L. subsp. *album* L., *Lindelofia kandavanensis* Bornm. & Gauba [vide Riedl, 1967: 141], *Ornithogalum orthophyllum* Ten., *Primula heterochroma* Stapf, *Prunella vulgaris* L., *Ranunculus* sp., *Rhynchocorys maxima* C. Richter, *Scutellaria tournefortii* Benth., *Teucrium hyrcanicum* L., *Veronica* sp. [*persica* Poret in Lam. ?], *Viola alba* Bess. subsp. *sintenisii* (W. Becker) W. Becker) and climbers such as *Jasminum*; the forest (for which see, e. g., TURRILL, 1945, and BOBEK, 1968) with a dense, shrubby undergrowth (*Buxus sempervirens* L., *Gleditsia caspica* L., *Ruscus hyrcanus* Woronow) and various woody climbers (*Smilax*, *Vitis* spp.).
- [2] 1850 V Chālūs valley 4 km above Waliābād. Blackthorn thickets. *Fritillaria kotschyana* Herbert in Lindl., *Lathyrus rotundifolius* Willd., *Rosa* sp.
- [6] 2400 VII Kandavān pass 8 km above Siāhbīshe. Thorn-cushion zone, with denser vegetation and relics of limited former cultivation adjoining stream. *Astragalus* sp. (*myobroma* group), *Campanula stevenii* M. & B. subsp. *beauverdiana* (Fom.) Rech. f. & Schiman-Czeika, *Tripleurospermum disciforme* (C. A. Mey.) Schulz Bip., *Dactylorhiza umbrosa* (Kar. & Kir.) Nevski, *Onosma dichroanthum* Boiss., *Pedicularis condensata* M. Bieb., *Trifolium* sp., *Veronica* ? *persica* Poir. in Lam., *Vicia variegata* Willd.
- [7] 1370 V Chālūs valley 7 km below Waliābād. Open scrub on steep slopes. *Alcea* sp. (*hyrcana* (Grossh.) Grossh. ?), *Anchusa italica* Retz., *Dianthus orientalis* Adams aggr. sp. [Determined by RECHINGER 1966 as *pogonopetalus* Boiss. & Kotschy, but the name does not appear in the subsequently published *Flora Iranica*, 163, Caryophyllaceae. The *Index Kewensis* refers *pogonopetalus* to *orientalis*].

lis.], *Echinops ritrodes* Bunge, *Echium amoenum* Fisch. & Mey., *Glaucium corniculatum* (L.) Rudolph, *Roemeria refracta* DC

- [8] 2300 VII Kandavān pass 5 km above Siāhbiše. Subalpine meadow, dense vegetation on steep slopes. *Stachys byzantina* C. Koch, *Salvia* spp. (probably same spp. as at [56]).
- [9] 580 V Chālūs valley 4,5 km above Marzānābād. Semi-desert and scrub.
- [15] 1500 VI Kalār Dasht, Sardāb Rūd 3,5 km above Rūdārak. Fluvial vegetation in narrow valley in beech forest zone (*Fagus orientalis* Lipsky). *Dionysia aretioides* (Lehm.) Boiss., *Echium amoenum* Fisch. & Mey., *Marrubium vulgare* L., *Ornithogalum bungei* Boiss.
- [16] 1460 V Chālūs valley 5,5 km below Waliābād. Open scrub. *Reseda* sp., *Salvia sclarea* L., *Vicia* sp.
- [17] 1140 VI Kujūr, col on Nāzerābād road 6 km E of Bastān. Open oak woodland (*Quercus castaneifolia* C.A. Mey.), similar to English parkland. *Colutea* sp., *Consolida divaricata* (Led.) Schröd., *Nigella* sp., *Origanum* sp.
- [19] 300 IV Chālūs valley close above Pol-e-Zoghāl. All collecting at Sta. 19 at *Prunus divaricata* Ledeb.
- [20] 1050 V Kalār Dasht, Lāhū. Cultivated plain. All at *Salix*.
- [24] 500 V Kujūr, 2 km SE Ḥasanābād. Semidesert fringing *Cupressus* zone, with scattered shrubs. *Anagallis arvensis* L., *Arnebia grandiflora* (Trautv.) M. Pop. in Lapin., *Campanula rapunculus* subsp. *lambertiana* (A. DC.) Boiss., *Cerasus microcarpa* (C. Meyer) Boiss., subsp. *microcarpa* [det. BROWICZ], *Crocus* sp., *Eruca sativa* Miller [extensive stand, much visited by eucerine and anthophorine bees], *Gagea* sp., *Hyoscyamus* sp., *Muscari* sp., *Paliurus spina-christi* Mill., *Stachys schtschegleevii* Sosn.
- [33] 1700 V Chālūs valley 1,5 km below Waliābād. Semidesert.
- [34] 660 V Chālūs valley 4 km below Dozd-e Band. Fluvial vegetation.
- [37] nr s.l. IIIA Sī Sangān forest, 40 km E of Chālūs. Clearings in primary [Hyrcanian] forest.
- [39] 900 VI Kujūr, Nāzerābād road 1 km NE of Bastān. *Quercus castaneifolia* woodland, much cut over, with scattered shrubs, including

Berberis, *Cornus*, *Crataegus* and *Prunus*. *Cyclamen coum* Miller, *Lithospermum officinale* L., *Linum nodiflorum* L., *Ophrys sphegodes* Miller subsp. *transhyrcana* (Czernjak.) Soó, *Orchis stevenii* Reichenb. f., *Steenia satyrioides* (Stev.) Schltr., *Viola* sp.

- [48] 2200 VII Central Alborz, Kandavān pass near Pol-e Zangūleh. Subalpine meadow. *Ixiolirion tataricum* (Pall.) Herb., *Onosma* sp., *Ranunculus* sp., *Salvia* spp., *Verbascum* sp., *Vinca* sp.
- [50] 680 V Kujūr, near bridge over stream 1,5 km below Nīres.
- [56] 2450 VII Central Alborz, Īlekāh road 4 km above Pol-e Zangūleh. *Astragalus* spp., *Centaurea kotschy* (Boiss. & Heldr.) Hayek, a dwarf *Eryngium* sp., *Salvia verticillata* L. subsp. *amasiaca* (Freyn & Bornm.) Bornm. [further referred to simply as *S. amasiaca*], *Salvia atropatana* Bunge. *Bombus* spp. frequenting the *Salvia* in large numbers.

Tehrān

- [10] 2150 VIII Southern slopes of central Alborz, Gach-e Sar. Banks of Karaj River and adjacent cultivation zone. Species-rich vegetation.
- [49] 2500 VIII Southern slopes of central Alborz, Kandavān pass 7 km above Gach-e-Sar.

Gorgān

- [65] 60 steppe Turkoman steppe 5 km S of Gonbad-e-Qābūs. *Eremostachys laciniata* (L.) Bunge (in Ledeb.), *Hyoscyamus* sp.

Life zones in the central Alborz (column 3)

Northern slopes

- I Shore. Between the shore and the forest, for almost the whole length of the Māzandarān coast, extends a sand-stretch of variable width, sometimes broken by lines of denser vegetation running parallel with the shore, clothed with a thorny scrub (*Paliurus*, *Gleditsia*, *Prunus*, *Punica*, *Mespilus*, *Rubus*) (fig. 1) and occasionally developing a more or less closed turf.
- II Coastal plain, largely cleared for cultivation. Winter comes late on the Māzandarān coast, owing to the retarding effects of the Caspian and the Alborz, and is mild, with snow in about one in four winters and few frosts [mean coldest month February, with mean noon temperature 12°C]. Forest formerly covered the whole coastal plain (see NOEL, 1921 - the

Captions to figures (p. 116-117)

Table I

Fig. 1: Thorny scrub (mainly *Gleditsia*) at transition from sand-stretch to forest, with carpet of *Ornithogalum* and scattered *Rhynchosorys*. Station 1, Māzandarān coast near mouth of Tīlrūdsar, -20 m. 30 March 1965. [No 0106]

Fig. 2 Māzandarān: view across coastal plain to northern foothills of Alborz range, where the Hyrcanian forest is fully developed; Takht-e Suleimān group (Ālam Kūh, 4840 m) in distance. 5 km E of 'Abbāsābād. 16 October 1967. [No 4014]

Fig. 3: Clearing in forest (*Alnus*, *Pterocarya*) with rampant growth of *Rubus* and *Smilax*. Station 1, Māzandarān coast near mouth of Tīlrūdsar, -20 m. 30 May 1965. [No 0417]

Fig. 4: *Cupressus horizontalis* (MILLER) VOSS on limestone outcrop above Station 19; scattered herbs. [This rather narrow outcrop extends for a considerable distance from east to west in the northern foothills of the Alborz, and appears at differing altitudes: e.g., 240-300 m in the Chālūs valley, ca. 300-600 m in Kujūr, ca. 650 m in the Harāz valley.] Near Pol-e-Zoghāl. 3 March 1966. [No 1216]

Fig. 5: Semidesert and open scrub on fringe of *Cupressus* zone. Station 24, Māzandarān, Kujūr, 2 km SE of Ḥasanābād, 500 m. 8 March 1966. [No 1227] [Large examples of the Cretaceous (Upper Chalk) echinoid *Echinocorys scutata* LESKE (det. C.W. WRIGHT) are found weathering out of the slopes here.]

Fig. 6: Montane forest. Station 15, Māzandarān, Kalār, Sardāb Rūd valley 3,5 km above Rūdbārak, 1500 m. 6 September 1967. [No 3804]

Table II

Fig. 7: Oak (*Quercus castaneifolia* C.A. MEY.) woodland. *Cupressus* zone in background. Station 39, Māzandarān, Kujūr, 1 km NE of Bastān, ca. 900 m. 21 May 1967. [No 3518]

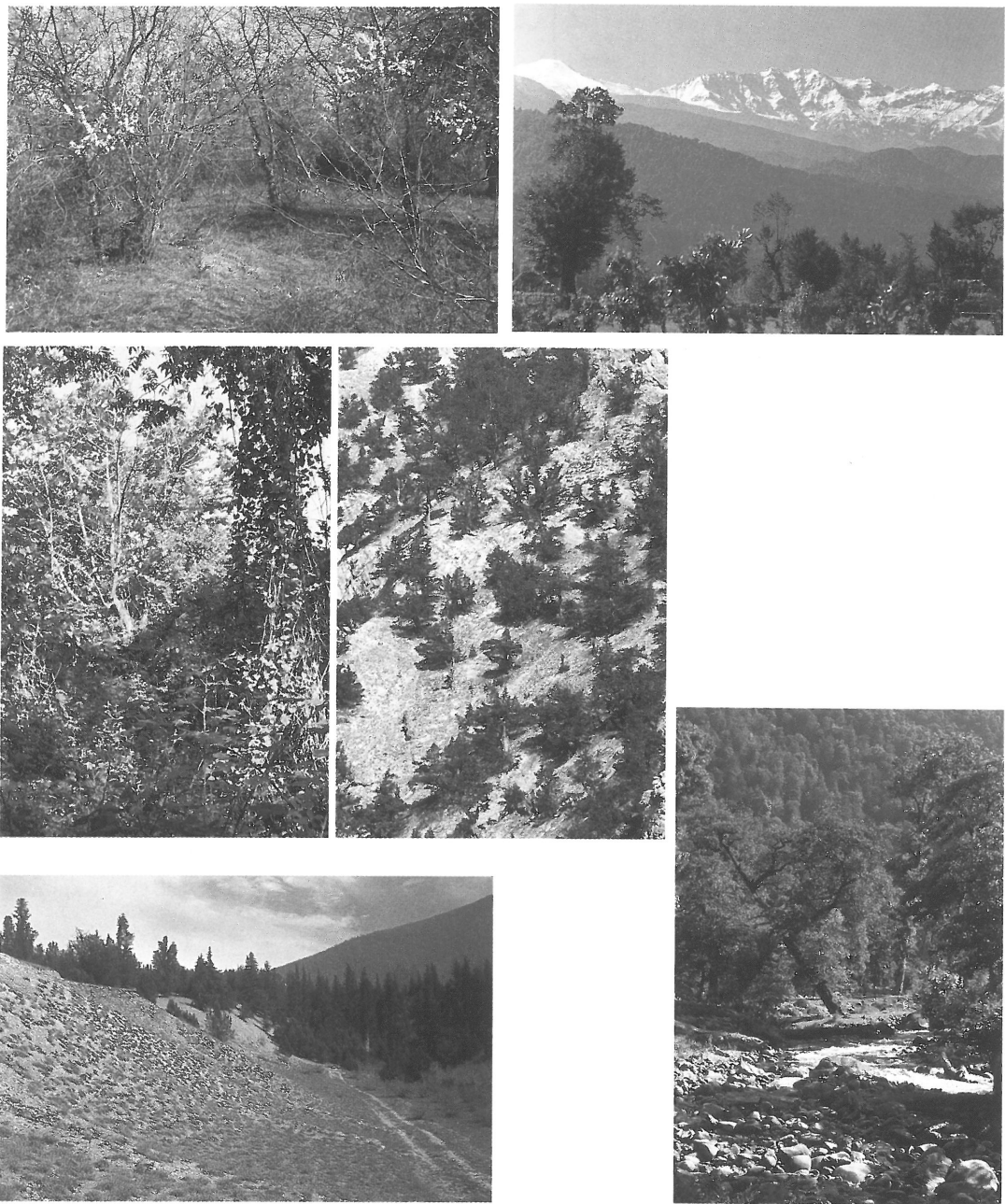
Fig. 8: Open woodland and grassland. Station 17, Māzandarān, Kujūr, col on Nāzerābād road 6 km E of Bastān, 1140 m. 23 May 1966. [No 1803]

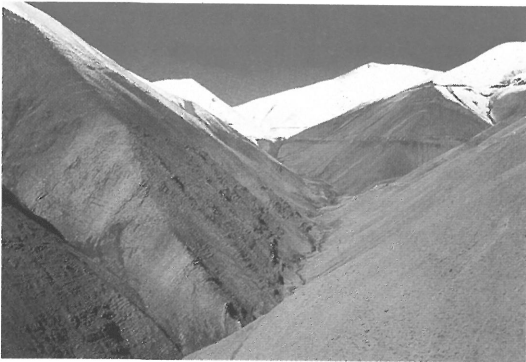
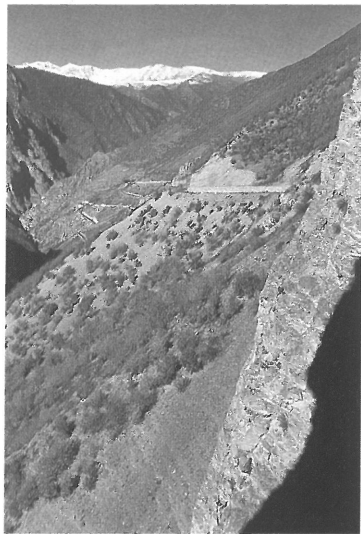
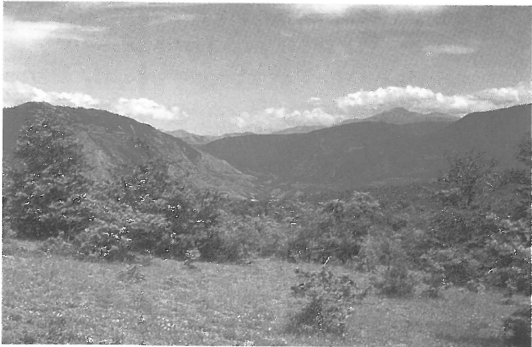
Fig. 9: Brushwood and montane semidesert. Māzandarān, Chālūs valley 5,5 km below Waliābād, 1640m [Station 16, 1460 m, in middle distance]. 11 November 1965. [No 0928]

Fig. 10: Thorn-cushion community. Station 6, central Alborz, Kandavān pass, N approach, 8 km above Siāhbīshe, 2400 m. 7 June 1966. [No 1830]

Fig. 11: Subalpine meadow. *Myosotis*, *Onosma*, *Ranunculus*, *Salvia*, *Cynareae* spp. Station 48, central Alborz, Kandavān pass near Pol-e-Zangūleh, 2200 m. 8 July 1967. [No 3616]

Fig. 12: Thorn-cushion zone. Station 49, central Alborz, Kandavān pass, S approach, 7 km above Gach-e-Sar, 2500 m. 11 November 1965. [No 0922]





tigers, which, NOEL noted, lurked in the boxwood thickets in the daytime and strolled about openly on the beach in the nighttime, are now gone -, RABINO, 1928), except for the narrow zone bordering the shore, and the northern foothills of the Alborz, and still nearly reaches the shore in a few places (e. g., at Kelārābād [1] and Sī Sangān [37]). Peak bee activity in the forest comes in early March, before the forest comes into leaf and while the more open parts are carpeted with flowers.

III Lowland and lower montane deciduous broadleaf forest.

IIIA High forest (Hyrcanian forest) (fig. 2). The forest comprises about forty species of hardwoods, including *Acer*, *Carpinus*, *Celtis*, *Diospyros*, *Fagus*, *Fraxinus*, *Morus*, *Parrotia*, *Pterocarya*, *Quercus*, *Ulmus*, and *Zelkova*. There is a dense undergrowth of *Buxus*, and clearings rapidly become choked with *Smilax*, *Rubus*, *Ruscus* and *Gleditsia* (fig. 3).

IIIB Brushwood: at its higher levels the forest degenerates into brushwood, with the loss or reduction in numbers of some species, e. g., *Celtis*, *Diospyros* and *Pterocarya*.

IV *Cupressus* zone: a narrow zone of *C. horizontalis* (Miller) Voss on calcareous soils on southern slopes of foothills at between about 250 and 650 m (in the Chālūs valley at 240-300 m, in Kujūr at 300-500 m) (fig. 4).

V Semidesert alternating with brushwood and thorny scrub, these last generally thin but occasionally denser or even closed, particularly on northfacing slopes (fig. 5).

VI Montane forest (deciduous broadleaf forest) (fig. 6). In Kujūr, at around 1000 m, areas of open (*Quercus castaneifolia*) woodland and grassland, resembling English parkland (fig. 7, 8), presumably represent the remains of middle montane forest. [Kujūr, or Rūyān, once an area of some prosperity, its city, the capital of the mountain district of Ṭabaristān, destroyed during the Mongol invasion.]

VII Brushwood and montane semidesert (fig. 9). Above the tree-line, thorn-cushion communities (fig. 10) cover most of the ground, but where this is better watered limited more or less closed communities may develop (fig. 11).

Southern slopes

VIII Semidesert with no marked zonation, merging with Zone VII at watershed of Caspian and Qum-Masīleh drainage basins. Thorn-cushion communities appear at about 2000 m and become well-developed higher up (fig. 12). They are very rich in species, especially of Leguminosae, where scores of species of one genus may share the same habit.

Topography

The World 1:500,000 (Series 1404) and 1:250,000 sheets (Series 1501 Air) are unreliable, owing presumably to inadequate ground control, and are short on names both of places and of geographical features. The most useful map for localities in the central Alborz is BOBEK (1957);

coastal localities will be found in RABINO's sketchmap (1928). Dated but still useful accounts of the Caspian provinces, with illustrations showing something of the landscape, are FORTESCUE (1924), NOEL (1921) and STARK (1934a).

Species treatments

Authorities for plant names, given in the Introduction, are not repeated in this Section.

Bombus LATREILLE, 1802

1 *Bombus* (*Kallobombus*) *cardui radoszkowskii* D. T., 1890

Bombus perplexus RAD., 1884: 83, pl. 3 fig. 35; ♀♂♂; du Caucase. Junior primary homonym of *Bombus perplexus* CRESSON, 1863

Bombus radoszkowskyi DALLA TORRE, 1890: 139; nom. nov.

Bombus soroensis var. *tricolor* ZETT., PITTIONI 1937: 119.

Bombus soroensis F., REINIG 1939: 147.

Material

[7] 17 ix 66, 1♂.

[10] 27 vii 67, 1♀.

[48] 5 vii 67, 3♀; 8 vii 67, 1♀; 21 vii 67, 1♀; 24 viii 67, 1♀.

[56] 24 viii 67, 1♂ 2♀, *Salvia amasiaca*; 28 viii 67, 1♂ 1♀; 2 ix 67, 3♂ 1♀; 12 ix 67, 2♀; 19 ix 67, 27♂ 6♀, *Salvia amasiaca*; 7 x 67, 2♂ 1♀.

Prior regional records

[P1] 12 viii 1936, 2♂ (*BRANDT*) (PITTIONI, 1937: 119).

[R2] 14-18 vii 1937, 2♀ (*PFEIFFER & FORSTER*) (REINIG, 1939: 147).

Phenology: ♂♂(37) 12 viii - 7 x.

♀♀(6) 5 vii - 24 viii.

♀♀(16) 14/18 vii - 7 x.

Habitat: montane semidesert, especially in thorn-cushion zone. 1370-2450 m, but one record [P1] from 1000 m [not recovered at *BRANDT*'s apparent locality].

2 *Bombus* (*Bombus*) *terrestris* (L., 1758) [= *lucorum* (L., 1761)]

Material

[15] 17 vii 67, 2♂; 3 viii 67, 1♂. Gonocoxite lengths 2.01, 1.87, 1.95 mm: i.e., within *terrestris* range and below mean for confirmed *magnus* (see *BAKER*, 1996).

[56] 24 viii 67, 1♂ (worn and faded; *lucorum* det. *YARROW*), *Salvia amasiaca*. Gonocoxite length 1.97 mm.

Phenology: ♂♂ (4) 17 vii -24 viii.

Remarks: the three ♂♂ from [Sta 15] were determined as *magnus* by YARROW but are revised to *terrestris*; a fourth ♂, from [Sta 50], also determined as *magnus* by YARROW is revised to *audax* (gonocoxite length 2.21 mm). [YARROW did not recognize any of the ♀♀ or ♂♂ seen by him as being other than '*terrestris*' [*audax*], except for one ♀ from Station 17 (11 vii 1966), now revised to *audax*, marked '*terrestris* or *lucorum*'.]

3 *Bombus (Bombus) audax dalmatinus* D. T., 1882

Bombus terrestris var. *dalmatinus* DALLA TORRE, 1882: 26; [♀]; Fiume, Livorno, Sizilien, Spalato und Ragusa, Athen, Amasia und Elisabethpol. Restricted typical locality Spalato [Split].

Bombus (Bombus) terrestris (L.), PITTIONI, 1937: 119.

Bombus (Bombus) terrestris (L.), REINIG, 1939: 148.

Material

- [1] 26 iii 65, forest, 1♀; 17 vi 65, 2♂, *Rubus*; 16 ii 66, 1♀, *Ornithogalum orthophyllum*; 25 ii 66, 2♀; 26 ii 66, 1♀; 28 iii 66, 1♀; 11 v 67, 1♂, *Rhynchosorys maxima*; 12 iii 68, 1♀, *Chaenomeles*.
- [2] 7 vi 66, 1♀.
- [7] 6 vii 65, 2♂; 17 ix 66, 1♂.
- [8] 9 vii 66, 1♀.
- [15] 14 v 66, 1♀; 6 ix 67, 1♂ (gonocoxite 2.17 mm).
- [16] 21 vi 67, 1♀ (worm, wings ragged: fundatrix).
- [17] 23 v 66, 3♂; 13 vi 66, 1♀; 11 vii 66, 1♂.
- [20] 26 iii 68, 1♀, *Salix*.
- [24] 29 iv 67, 1♀.
- [34] 9 vii 66, 1♂; 5 vii 67, 1♀, *Rubus*.
- [48] 5 vii 67, 2♀; 8 vii 67, 1♀.
- [50] 28 vi 67, 1♂ [*magnus* det. YARROW: this ♂ has slightly more pale hair on head than usual and greater extension of pale hairs on to mesepisterna; gonocoxite 2.21 mm] 1♂.
- [56] 14 viii 67, 1♀; 24 viii 67, 1♀, *Salvia amasiaca*; 28 viii 67, 1♂; 12 ix 67, 1♂; 19 ix 67, 11♂, *Salvia amasiaca*; 7 x 67, 4♂: this whole series ♂♂ more or less pale-haired on vertex and lower part of face.
- [65] 6 iv 68, 1♀.

Phenology: ♂♂ (19) 28 vi [50: 680 m] - 7 x [56: 2450 m].

♀♀ (21) 16 ii [1: -20 m] - 24 viii [56: 2450 m].

♂♂ (12) 11 v [1: -20 m] - 28 viii [56: 2450 m].

Fundatrix ♀♀ appear in February or March on the Caspian coastal plain, rather later on the Turkoman steppe in Gorgan.

Habitat: in all zones, from coastal strip in Māzandarān and Gorgan steppe to montane semidesert.

4 *Bombus (Sibiricobombus) vorticosus iranensis* PITTIONI, 1937

Bombus niveatus var. *skorikovi* FRIESE: 1911b [31 August]: 572; ♀; Persien und Transkaukasien. Junior primary homonym of *Bombus skorikovi* VOGT, 1911 [before 30 May].

Bombus vorticosus m. *iranensis* PITTIONI, 1937: 120; [♂ ♀]; no locality specified [Iran: Nissa - PITTIONI had only a single ♂ from his second locality, Rīneh]; no type designated.

Bombus vorticosus m. *iranensis* ff. *intermedius* and *mixtus*, ab. *brandti*, PITTIONI, 1937: 120: invalid infrasubspecific names.

Bombus vorticosus iranensis PITTIONI, REINIG 1939: 147.

Pyrobombus (Sibiricobombus) vorticosus iranensis PITTIONI, RASMONT, 1983a: 168.

Material

[8] 19 vi 65, 1 ♀; 9 vii 66, 1 ♀.

[16] 5 vii 67, 1 ♀.

[33] 9 vii 66, 1 ♀.

[48] 14 viii 67, 1 ♀; 17 viii 67, 1 ♀.

[49] 16 vi 67, 1 ♀.

[56] 14 viii 67, 10 ♀; 17 viii 67, 1 ♀ 11 ♀; 24 viii 67, 13 ♂ 5 ♀; 28 viii 67, 17 ♂ 1 ♀ 4 ♀; 2 ix 67, 19 ♂ 1 ♀; 19 ix 67, 4 ♂.

Prior regional records

[P2] 10-20 vii 1936, 3 ♂ 11 ♀; 20 vii - 1 viii 1936, 2 ♂ 2 ♀ 11 ♀; 1-10 viii 1936, 3 ♀ 6 ♀ (all *BRANDT*) (PITTIONI, 1937: 120).

[P5] 22 vii 1936, 1 ♂ (*WAGNER*) (PITTIONI, 1937: 120).

[R1] 19-23 vii 1937, 2 ♀ (*FORSTER*) (REINIG, 1939: 147).

Phenology: ♂ ♂ (53) 24 viii - 19 ix.

♀ ♀ (4) 16 vi - 28 viii.

♂ ♀ (36) 5 vii - 2 ix.

Habitat: montane semidesert, 1460->3000 m.

5 *Bombus (Sibiricobombus) niveatus niveiventris* FRIESE, 1911

Bombus lapidarius var. *niveiventris* FRIESE, 1911a: 456; ♀; Russ. Armenien.

Bombus niveatus m. *persicus* PITTIONI, 1937: 121; [♂ ♀]; no locality specified [Iran: Nissa - PITTIONI had only a single ♀ from his second locality, Rīneh]; no type designated. Junior homonym of *Bombus persicus* RADOSZKOWSKY, 1881.

Bombus niveatus m. *persicus* ff. *intermedius*, *mixtus*, PITTIONI, 1937: 121; invalid infrasubspecific names.

Pyrobombus (Sibiricobombus) niveatus persiensis RASMONT, 1983: 168; nom. nov. for *persicus* PITTIONI, 1937, nec RADOSZKOWSKY, 1881. **Syn. nov.**

Material

[8] 9 vii 65, 1 ♀.

[56] 17 viii 67, 9 ♀ (2 large); 24 viii 67, 3 ♂ 5 ♀ (large); 28 viii 67, 1 ♂ 4 ♀; 2 ix 67, 2 ♂ 1 ♀; 19 ix 67, 1 ♂.

Prior regional records

[P2] 10-20 vii 1936, 2♂ 2♀; 20 vii - 1 viii 1936, 1♂ 1♀ 7♀; 1-10 viii 1936, 1♀ 2♀ (all BRANDT) (PITTIONI, 1937: 121).

[P5] 22 vii 1936, 1♀ (WAGNER) (PITTIONI, 1937: 121).

Phenology: ♂♂ (10) 10/20 vii - 19 ix.

♀♀ (2) 20 vii/1 viii - 1-10 viii (but from the observed dates of the workers, fundatrices must be active by mid-June).

♀♀ (31) 9 vii - 2 ix.

Habitat: montane semidesert, 2300-2450 m. Flies with *vorticossus iranensis*, frequenting the same plants, but less abundant. At Station 56 (2450 m) on 24 viii 67 these were among no fewer than 12 species of *Bombus* visiting an extensive stand of *Salvia amasiaca* (accompanied in places by smaller numbers of the larger-flowered, white species, *S. atropatana*) on disturbed ground which also harboured an uncommon quantity of pit vipers (*Agkistrodon halys caucasicus* NIKOLSKY). The other ten *Bombi* present were *incertus* Mor., 1881, *apollineus* SKOR., 1910, *simulatilil* RAD., 1888, *subterraneus latreillellus* (K., 1802), *armeniacus armeniacus* (RAD., 1877), *muscorum insipidus* RAD., 1884, *persicus persicus* RAD., 1881, *cardui radoszkowskii* D. T., 1890, *audax dalmatinus* D.T., 1882, and *terrestris* (L., 1758).

The taxa *niveiventris*, *incertus*, *apollineus* and *simulatilil*, all of which occurred together in other montane localities in the Alborz also, show strong convergence in colour pattern.

Taxonomy: The relationship between *vorticossus* and *niveatus* is unclear. In the Alborz, *vorticossus iranensis* and *niveatus niveiventris*, which there, from the present samples, have quasi-identical flight periods, differ in little but colour (which appears constant: no intermediates present in Station 56 populations - 53♂ 2♀ 31♀ *iranensis*, 7♂ -♀ 19♀ *niveiventris*) and in the fact that the former occurs at substantially lower altitudes (Stations 16, 33).

6 *Bombus* (*Cullumanobombus*) *apollineus* SKORIKOV, 1910

Bombus apollineus SKORIKOV, 1910a: 412; [♀♂♂]; Erivansk. Gub. [♀♂♂] ... Ani, Karsk. Obl. [♂].
Bombus (*Cullumanobombus*) *apollineus* SKOR., REINIG, 1939: 148.

Material

[8] 19 vi 65, 2♀.

[48] 14 viii 67, 1♀.

[56] 17 viii 67, 1♀; 24 viii 67, 1♂, *Salvia amasiaca*; 2 ix 67, 1♀.

Prior regional records

[R1] 19-23 vii 1937, 1♂ (FORSTER) (REINIG, 1939: 148).

[R4] 3-7 vii 1936, 1♀ (PFEIFFER) (REINIG, 1939: 148).

Phenology: ♂♂ (2) 19/23 vii - 24 viii.

♀♀ (4) 19 vi - 2 ix.

♀♀ (2) 14 viii - 17 viii.

Habitat: montane semidesert, 2200-2300 m. *Contrib. entomol.* 46.1.109-132

7 *Bombus (Pyrobombus) haematurus* KRIECHBAUMER, 1870

Bombus haematurus KRIECHBAUMER, 1870: 157; ♀; Armenien.

Material

- [1] 29 iii 65, 1♀; 30 iii 65, 2♀; 31 iii 65, 1♀; 11 iv 65, 1♀; 27 iv 65, 1♂, *Lamium album*; 26 v 65, 2♂, *Calystegia silvestris*; 27 v 65, 1♂; 10 ii 66, 1♀, *Ornithogalum orthophyllum*; 23 ii 66, 1♂, *Ornithogalum orthophyllum*; 25 ii 66, 2♀; 26 ii 66, 4♀; 12 iii 66, 1♀; 16 iii 66, 4♀ 1♂, *Lamium album*; 30 iv 66, 1♂, *Rhynchospora maxima*; 20 ii 68, 1♀, *Chaenomeles*; 8 iii 68, 2♀; 12 iii 68, 2♀, *Chaenomeles*.
- [10] 27 vii 67, 1♂.
- [17] 23 v 66, 1♂; 13 vi 66, 4♂ 1♂.
- [19] 24 ii 66, 1♀, *Prunus divaricata*.
- [37] 16 iii 67, 1♀, *Viola*; 25 iii 67, ♀♀ - not taken; 1 iv 67, 1♀.
- [39] 20 iii 68, 1♀.

Phenology: ♂♂ (5) 13 vi - 27 vii.
 ♀♀ (27) 10 ii - 11 iv.
 ♂♂ (8) 16 iii - 13 vi.

Habitat: coastal plain, lower Chālūs valley to 300 m, Kujur to 1140 m. A typical species of forest clearings and woodland. The single late male from Gach-e Sar [10], at 2150 m, on the southern slopes of the main Alborz range, perhaps accidental.

8 *Bombus (Melanobombus) incertus* MORAWITZ, 1881

Bombus incertus MORAWITZ, 1881: 229; ♀; in Caucasion, in Höhen zwischen 3500-8000'... auch im Tjan-Schan.

Bombus (Lapidariobombus) incertus MOR., PITTIONI 1937: 119.

Bombus (Lapidariobombus) incertus RAD., REINIG 1939: 147.

Material

- [10] 17-19 vii 65, 2♀; 27 vii 67, 2♂.
- [48] 5 vii 67, 1♀; 8 vii 67, 6♀; 21 vii 67, 2♀.
- [56] 14 viii 67, 1♂; 17 viii 67, 2♂; 24 viii 67, 1♂ 1♀ 1♂; 28 viii 67, 1♀ 5♂; 2 ix 67, 7♂ 1♀ 6♂, *Salvia amasiaca*; 12 ix 67, 8♂, *Salvia amasiaca*; 19 ix 67, 63♂ 11♂; 7 x 67, 16♂ 1♂, mainly at *Salvia amasiaca*.

Prior regional records

- [P2] 10-20 vii 1936, 3♂; 20 vii - 1 viii, 4♂; 1-10 viii, 5♂ (all BRANDT) (PITTIONI, 1937: 119).
- [P4] 7 vii 1936, 2♀ 5♂ (WAGNER) (PITTIONI, 1937: 119).
- [P5] 22 vii 1936, 2♂ (WAGNER) (PITTIONI, 1937: 119).
- [R1] 19-23 vii 1937, 1♀ 11♂ (PFEIFFER & FORSTER) (REINIG, 1939: 147).
- [R2] 14-18 vii 1937, 1♂ (PFEIFFER & FORSTER) (REINIG, 1939: 147).
- [R5] 22-27 vii 1936, 3♂ (PFEIFFER) (REINIG, 1939: 147).

Phenology: ♂♂ (87) 24 viii - 7 x.
 ♀♀ (17) 5 vii - 2 ix.
 ♂♂ (71) 7 vii - 7 x.

Habitat: montane semidesert, 2150->3000 m.

9 *Bombus (Megabombus) argillaceus argillaceus* (SCOPOLI, 1763)

Apis argillacea SCOPOLI, 1763: 305, pl. 43 fig. 814; [♀]; Carniolia.

Bombus (Hortobombus) argillaceus (SCOP.), REINIG, 1939: 146.

Material

[9] 6 vii 65, 1♂ 1♀, *Salvia*.
 [17] 13 vi 66, 1♀; 11 vii 66, 1♂.
 [39] 28 vi 67, 1♀.
 [50] 28 vi 67, 2♀.

Prior regional record

[R3] 7-10 vii 1937, 1♀ (*PFEIFFER & FORSTER*) (REINIG, 1939: 146).

Phenology: ♂♂ (2) 6 vii - 11 vii.
 ♀♀ (2) 21 vi - 7/10 vii.
 ♂♂ (4) 13 vi - 6 vii

Habitat: *Quercus* woodland (Kujūr) and sub-montane semidesert (lower Chālūs valley and Kalār Dasht), 580-1140 m.

10 *Bombus (Megabombus) portchinsky* RADOSZKOWSKY, 1883

Bombus ruderatus (F.), var. du Caucase, RADOSZKOWSKY, 1878a: 194.

Bombus ruderatus (F.), ♀, Caucase (Mleti.), RADOSZKOWSKY, 1878b: 81.

Bombus portchinsky RADOSZKOWSKY, 1883: 209; ♀♂; de Dorotschischah (6500'), d'Adschikent (4000), de Fontan (5774'), de Mleti (5621') [♀], Passanaur (5621) [♂]. [RADOSZKOWSKY repeatedly used the above spelling.]

Bombus hortorum ab. *eriophoroides* VOGT, 1909: 50, footnote 2; Transkaukasien. [Not to be confused with *derhamellus* ab. *eriophoroides* VOGT, 1909: 50.]

Bombus hortorum ab. *propedistinguendus* VOGT, 1909: 74; Transkaukasien.

Bombus hortorum ab. *totocremeus* SKORIKOV, 1910b; 82; ♂; NW slope of Mashuk.

Bombus (Hortobombus) hortorum f. *heinrichi* BISCHOFF, 1936: 21; [♀]; Elburs [Alborz].

Bombus (Hortobombus) hortorum kussariensis PITTIONI, 1937: 116; ♀♀; type locality not stated [Kussari: 'Beschrieben nach Tieren aus Kussari (♀♀ und ♂♂), Helenendorf (♀) und Murut (♂) in Transkaukasien']; no type designated ['Type im Naturhistorischen Museum in Wien'].

Bombus (Hortobombus) hortorum propedistinguendus VOGT, REINIG, 1939: 146.

Material

[8] 9 vii 66, 2♂ 1♀.

[15] 17 vii 67, 2♀ (worn, fundatrices); 3 viii 67, 3♀; 6 ix 67, 3♂ 1♀.

[48] 14 viii 67, 1♀.

Prior regional records

[P1] 12 viii 1936, 1♀ (*BRANDT*) (*PITTIONI*, 1937: 116).

[R1] 19-23 vii 1937, 2♀ (*FORSTER*) (*REINIG*, 1939: 146).

[R2] 14-18 vii 1937, 3♂ (*FORSTER*) (*REINIG*, 1939: 146).

Phenology: ♂♂ (8) 9 vii - 6 ix.

♀♀ (4) 17 vii - 19/23 vii.

♀♀ (7) 9 vii - 6 ix.

Habitat: montane (*Fagus orientalis*) forest (Sardāb Rūd above Rūdbārāk) and semidesert, 1500- >3000 m.

11 *Bombus (Thoracobombus) pascuorum taleshensis* (RASMONT, 1983)

Megabombus (Thoracobombus) pascuorum (SCOP.) 'exerge *taleshensis*' subsp. *taleshensis* RASMONT, 1983b: 188; ♀♂; Iran: Talesh [*Tālīsh*] ... à l'ouest de Asalam [*Asālem*].

Material

[1] 26 x 67, 1♂, *Calamintha officinalis*.

[15] 17 vii 67, 1♀ 1♀.

[17] 13 vi 66, 2♀.

[34] 9 vii 66, 1♀ 1♀, on *Rubus*, by *Chālūs* R.

Phenology: ♂♂ (1) 26 x.

♀♀ (2) 9 vii - 17 vii.

♀♀ (4) 13 vi - 17 vii.

Habitat: coastal strip; *Chālūs* valley at 660 m, thorny riverside scrub; Kujur, Dasht Nazir, saddle 6 km E of Neris, 1140 m, open mixed woodland; Kalar, Sardāb Rūd valley at 1500 m, beech forest zone.

Remarks: apparently rare, not otherwise observed during four seasons' collecting (1965-1968) although *pascuorum* representatives were particularly looked for. It is not yet clear whether the Māzandarān population of *pascuorum*, clustered about the lower *Chālūs* valley, is identical with the *Tālīsh* population, separated by the Safid Rūd gap.

12 *Bombus (Thoracobombus) muscorum insipidus* RADOSZKOWSKY, 1884

Bombus insipidus RADOSZKOWSKY, 1884: 75, pl. 2 fig. 24; ♂♀; Satty, en Dagestan.

Bombus (Agrobombus) helferanus m. *insipidus* RAD., *PITTIONI* 1937: 117.

Bombus (Agrobombus) humilis insipidus RAD., *REINIG* 1939: 147.

Material

- [8] 19 vi 65, 2♀ 1♂.
 [10] 27 vii 67, 2♂.
 [15] 30 v 66, 1♀; 3 viii 67, 1♂ 1♀.
 [17] 23 v 66, 1♀; 13 vi 66, 1♀; 11 vii 66, 1♂ 1♀.
 [48] 5 vii 67, 1♀; 8 vii 67, 2♀; 14 viii 67, 1♀; 17 viii 67, 1♀.
 [56] 28 viii 67, 2♀; 19 ix 67, 1♂.

Prior regional records

- [P1] 12 viii 1936, 2♂ 2♀ (BRANDT) (PITTIONI, 1937: 117).
 [R2] 14-18 vii 1937, 1♂ (PFEIFFER & FORSTER) (REINIG, 1939: 147).

Phenology: ♂♂ (8) 11 vii - 19 ix
 ♀♀ (5) 19 vi - 8 vii.
 ♀♀ (11) 23 v - 28 viii.

Habitat: *Quercus* woodland (Kujūr), montane (*Fagus*) forest (Sardāb Rūd above Rūdbārak) and montane semidesert, 1000-2450 m.

13 *Bombus (Thoracobombus) simulatilis* RADOSZKOWSKY, 1888

Bombus simulatilis RADOSZKOWSKY, 1888: 317; ♀♂; Erzerum.
Bombus (Agrobombus) simulatilis RAD., PITTIONI 1937: 117.
Bombus (Agrobombus) simulatilis RAD., REINIG 1939: 147.

Material

- [8] 9 vii 66, 1♀.
 [56] 24 viii 67, 2♂, *Salvia amasiaca*; 19 ix 67, 1♂.

Prior regional records

- [P4] 7 vii 1936, 2♀ (WAGNER) (PITTIONI, 1937: 117).
 [R2] 14-18 vii 1937, 1♂ (PFEIFFER & FORSTER) (REINIG, 1939: 147).
 [R4] 3-7 vii 1936, 1♀ (PFEIFFER) (REINIG, 1939: 147).
 [R5] 22-27 vii 1936, 1♀ (PFEIFFER) (REINIG, 1939: 147).

Phenology: ♂♂ (4) 14/18 vii - 19 ix.
 ♀♀ (0)
 ♀♀ (5) 3/7 vii - 22/27 vii.

Habitat: montane semidesert, 2300->3000 m.

14 *Bombus (Eversmannibombus) persicus* RADOSZKOWSKY, 1881

Bombus persicus RADOSZKOWSKY, 1881: v; [♀]; regionem alpinam montis Demavend Persiae.
Bombus persicus RADOSZKOWSKY, 1883: 214; ♀; en Perse à Demavend [as n. sp.].

Bombus (Mucidobombus) persicus RAD., PITTIONI 1937: 117.

Bombus (Mucidobombus) persicus ff. ['Färbungsstufen'] *nigroanalis*, *ciliatus*, *mixtus* and *wagneri* PITTIONI, 1937: 118; invalid infrasubspecific names.

Bombus (Mucidobombus) persicus RAD., REINIG 1939: 146.

Material

[6] 9 vi 65, 6♀, *Vicia variegata*; 19 vi 65, 2♀, *Vicia variegata*.

[8] 19 vi 65, 4♀; 9 vii 66, 1♂.

[10] 17-19 vii 65, 1♀; 27 vii 67, 1♀ 2♂; 28 vii 67, 2♂.

[48] 5 vii 67, 2♀; 8 vii 67, 9♀; 14 viii 67, 1♂; 24 viii 67, 1♂.

[49] 16 vi 67, 7♀; 21 vi 67, 2♀.

[56] 14 viii 67, 1♀; 28 viii 67, 1♂ 4♀; 2 ix 67, 1♀ 1♂; 12 ix 67, 1♂; 19 ix 67, 9♂ 3♀; 7 x 67, 1♂. Chiefly at *Salvia amasiaca* and *S. atropatana*.

Prior regional records

[P2] 10-20 vii 1936, 1♂ 2♀ 10♂; 20 vii - 1 viii 1936, 2♀ 7♂; 1-10 viii 1936, 4♀ 7♂ (BRANDT) (PITTIONI, 1937: 119).

[P3] 18 vii 1936, 3♀ (WAGNER) (PITTIONI, 1937: 119).

[P4] 7 vii 1936, 5♀ 7♂ (WAGNER) (PITTIONI, 1937: 119).

[P5] 22 vii 1936, 1♀ (WAGNER) (PITTIONI, 1937: 119).

[R1] 19-23 vii 1937, 1♀ (PFEIFFER & FORSTER) (REINIG, 1939: 146).

[R2] 14-18 vii 1937, 1♂ (PFEIFFER & FORSTER) (REINIG, 1939: 146).

[R4] 3-7 vii 1936, 3♀ (PFEIFFER) (REINIG, 1939: 146).

[R5] 22-27 vii 1936, 7♀ (PFEIFFER) (REINIG, 1939: 146).

Phenology: ♂♂ (11) 10/20 vii - 19 ix.

♀♀ (52) 9 vi - 2 ix.

♂♂ (61) 7 vii - 7 x.

Habitat: montane semidesert, 2150->3000 m.

15 *Bombus (Subterraneobombus) subterraneus latreillellus* (KIRBY, 1802)

Apis latreillella K., 1802: 330; ♂; Barhamiæ.

Bombus (Subterraneobombus) subterraneus m. *latocinctus* VOGT, with f. *flavotaeniatus* VOGT, PITTIONI 1937: 116.

Bombus (Subterraneobombus) subterraneus L., 'var. geogr. [subsp.] *latocinctus* VOGT', with f. *flavotaeniata* VOGT, REINIG, 1939: 146.

Material

[8] 9 vii 66, 1♂.

[48] 8 vii 67, 1♀.

[56] 17 viii 67, 1♂; 24 viii 67, 3♂; 2 ix 67, 1♂.

Prior regional records

[P2] 20 vii - 1 viii 1936, 1♀ (BRANDT) (PITTIONI, 1937: 116).

- [P3] 18 vii 1936, 1♂ (WAGNER) (PITTIONI, 1937: 116).
 [R1] 19-23 vii 1937, 2♀ (FORSTER) (REINIG, 1939: 146).
 [R5] 22-27 vii 1937, 1♂ (FORSTER) (REINIG, 1939: 146).

Phenology: ♂♂ (1) 2 ix.
 ♀♀ (4) 8 vii - 20 vii/1 viii.
 ♂♂ (7) 9 vii - 24 viii.

Habitat: montane semidesert, 2100->3000 m.

16 *Bombus (Rhodobombus) armeniacus armeniacus* RADOSZKOWSKY, 1878

Bombus armeniacus RADOSZKOWSKY, 1878a: 202; ♀♂; Caucase, environs d'Erivan.

Bombus (Pomobombus) dumouchelii RAD., PITTIONI, 1937: 116.

Bombus (Fervidobombus) mesomelas armeniacus RAD., REINIG, 1939: 147.

Material

- [6] 9 vi 65, 5♀; 19 vi 65, 1♀.
 [8] 19 vi 65, 1♂; 9 vii 66, 1♂.
 [48] 5 vii 67, 1♀; 17 viii 67, 1♂.
 [49] 16 vi 67, 3♀, *Vicia*; 21 vi 67, 1♀.
 [56] 17 viii 67, 3♀; 24 viii 67, 3♂ *Anchusa italica*, 2♂ (1 *Salvia amasiaca*); 28 viii 67, 2♂ 3♀;
 2 ix 67, 6♂ *Salvia amasiaca*, 2♀; 19 ix 67, 3♂; 7 x 67, 1♂.

Prior regional records

- [P2] 10-20 vii 1936, 4♀; 20 vii - 1 viii 1936, 2♀; 1-10 viii 1936, 2♀ (all BRANDT) (PITTIONI, 1937: 116).
 [P5] 22 vii 1936, 1♂ (WAGNER) (PITTIONI, 1937: 116).
 [R1] 19-23 vii 1937, 1♀ (FORSTER) (REINIG, 1939: 147).
 [R2] 14-18 vii 1937, 1♂ (FORSTER) (REINIG, 1939: 147).
 [R5] 22-27 vii 1936, 2♂ (PFEIFFER) (REINIG, 1939: 147).

Phenology: ♂♂ (11) 14/18 vii - 19 ix.
 ♀♀ (12) 9 vi - 19/23 vii.
 ♂♂ (23) 19 vi - 7 x.

Habitat: montane semidesert, 2100->3000 m.

Psithyrus LEPELETIER, 1833

1 *Psithyrus (Ashtonipsithyrus) bohemicus* (SEIDL, 1837)

Bombus bohemicus SEIDL, 1837: 73.

Material

- [15] 3 viii 67, 2♂, 'punctuation behind ocelli rather unusual': YARROW.

Habitat: montane (*Fagus orientalis*) forest on the Sardābrūd above Rūdbārak (1500 m). Taken with *B. terrestris*, its probable host, *B. portchinsky* and *B. muscorum insipidus*.

2 *Psithyrus (Ashtonipsithyrus) vestalis* (GEOFFROY, 1785)

Apis vestalis GEOFFROY, 1785: 450; [Paris area].

Psithyrus vestalis f. *bluethgeniellus* POPOV, 1931: 144, 170; Astrabad [Gurgan].

Psithyrus vestalis m. *bluethgeniellus* POPOV, PITTIONI 1937: 121.

Material

[17] 11 vii 66, 1♀ (f. *bellus* LEP.), *Eryngium*.

Prior regional record

[P1] 12 viii 1936, 7♂ (*BRANDT*) (PITTIONI, 1937: 121).

Habitat: *Quercus castaneifolia* woodland in Kujur (1140 m). Taken with *B. audax*, its probable host, *B. argillaceus* and *B. muscorum insipidus*.

3 *Psithyrus (Fernaldaepsithyrus) quadricolor* LEPELETIER, 1833

Psithyrus quadricolor LEP., 1833: 376; ♀; Les Pyrénées.

Psithyrus (Fernaldaepsithyrus) quadricolor rossicus POPOV, PITTIONI 1937: 122.

Material

[15] 17 vii 67, 2♀.

[48] 10 vi 67, 1♀, *Ixiolirion tataricum*.

Habitat: montane (*Fagus orientalis*) forest on Sardāb Rūd above Rūdbārak (1500 m), taken with *B. terrestris*, *B. portchinsky* and *B. pascuorum taleshensis*, and subalpine meadow (in montane semidesert zone) near Pol-e Zangūleh (2200 m). Host uncertain, possibly *B. cardui radoszkowskii*.

Remarks: These three are no doubt consubspecific with the ♂♂ from the Chālūs Valley recorded by PITTIONI as *rossicus* POPOV, 1931, but it is uncertain whether this Alborz population is in fact referable to that subspecies.

Comment

Few species of *Bombus* occur on the Caspian coastal plain and of these only *B. haematurus*, found principally in clearings in the forest, and the nearly ubiquitous *B. audax* are at all common. The species become more numerous as one leaves the forest zone and ascends into montane semidesert and the thorn-cushion zone with its species-rich vegetation. Here such species as *B. cardui*, *vorticatus*, *niveatus*, *incertus*, *persicus* and *armeniacus* are locally abundant to heights of 3000 m or more as late as September and October.

Collecting expeditions to higher altitudes frequently prove abortive: severe frost as late as June may cause a substantial setback to flowering (e. g., at Station 8, 2300 m, on 21 June 1967 the vegetation had not recovered from frosts of earlier in the month), and early snow, or, at any time during the summer months, heavy cloud drifting up the northern valleys from the coastal plain, may also curtail bee activity.

Although collections were made in, or close to, all the localities visited by BRANDT, WAGNER, PFEIFFER and FORSTER, and although visits extended over a much longer period than the visits made by those collectors, several species recorded by PITTIONI or by REINIG, all rare alpine forms, were not encountered. These were four species recorded by PITTIONI [*B. (Sibiricobombus) sulfureus* FRIESE, 1904, *B. (Mendacibombus) shaposhnikov* SKORIKOV, 1909, *B. (Mendacibombus) handlirschianus* VOGT, 1909, and *P. (Metapsithyrus) redikorzevi* POPOV, 1931], and one additional species recorded by REINIG [*B. (Cullumanobombus) silantjewi* MORAWITZ, 1892, the name erroneously attributed to RADOSZKOWSKY]. The actual identities of the species recorded under some of these names are uncertain [as to *shaposhnikov* and *handlirschianus*, see WILLIAMS, 1991: 42, and as to *redikorzevi* POPOV, which PITTIONI thought might be the male of *ferganicus* RADOSKOWSKY, 1893, the same author, 1991: 50: WILLIAMS does not include Iran within the distribution of either *redikorzevi* [= *morawitzianus* POPOV, 1931] or *ferganicus*].

Two species not recorded by PITTIONI or by REINIG were collected, *B. haematurus*, recorded however by SKORIKOV (1938: 146) from Astrabad [Astarābād, now Gurgān] and Germab [?Garmābsar in Lārijān], and the subsequently-described *B. pascuorum talehensis* (RASMONT, 1983).

Acknowledgments

The assistance of my wife, Mrs M. W. BAKER, of my son, Dr. P. H. B. BAKER, and of, especially, among Iranian friends, Mr MANSŪR ZAND BASĪRĪ, in collecting in Iran is gratefully acknowledged. I am also indebted to the late Dr. I. H. H. YARROW for determinations of some of the species of *Bombus* and *Psithyrus* listed and for the synonymy quoted under *Bombus portchinsky* [given by him as *portschinskyi*]; to Prof. Dr. K. H. RECHINGER (Wien), Dr. J. RENZ (Basel), Dr. H. RIEDL (Wien), and Dr. K. BROWICZ (Kórnik) for naming many of the plants collected (deposited in the Naturhistorisches Museum, Wien, for the *Flora Iranica*); to the librarians of the departmental and general libraries of the Natural History Museum, London (especially Miss J. HARVEY and Miss L. MITCHELL), the librarian, Linnean Society of London (Miss G. DOUGLAS), and the Hope Librarian, University Museum, Oxford (Mrs S. BRECKNELL), for access to literature; and to the Linnean Society of London and the National Environmental Research Council for a grant from the Taxonomic Publications Fund towards the cost of the illustrations.

References

- BAKER, D. B. 1996: On a collection of *Bombus* and *Psithyrus* principally from Sutherland, with notes on the nomenclature or status of three species (Hymenoptera, Apoidea). - British Journal of Entomology and Natural History, 9: 7-19.
- BISCHOFF, H. 1936: Schwedisch-chinesische wissenschaftliche Expedition nach den nordwestlichen Provinzen Chinas unter Leitung von Dr. SVEN HEDIN und Prof. SŪ PING-CHANG. Insekten, gesammelt vom schwedischen Arzt der Expedition Dr. DAVID HUMMEL 1927-1930. 56. Hymenoptera. 10. Bombinae. - Arkiv för Zoologi, 27A(38): 1-27.
- BOBEK, H. 1957: Karte der Takhte-e Sulaimangruppe im mittleren Alburzgebirge, Nordiran. - Wien; Freytag-Berndt und Artaria. [See also Alpine Journal, 63, no. 297 (1958).]

- BOBEK, H. 1968: Vegetation, ch. 8, pp. 280-293, fig. 88, in FISHER, W. B., (ed.), The Land of Iran, XIX + 784 pp., 16 pl., 151 fig., 15 tables. Cambridge; C.U.P. (The Cambridge History of Iran, 1).
- DALLA TORRE, K. W. VON 1882: Bemerkungen zur Gattung *Bombus* LATR. II. 3. Zur Synonymie und geographischen Verbreitung der Gattung *Bombus* LATR. - Berichte des naturwissenschaftlich-medizinischen Vereines in Innsbruck, 12: 14-31.
- DALLA TORRE, K. W. VON 1890: Hymenopterologische Notizen. XII. Zur *Bombus*-Synonymie. - Wiener entomologische Zeitschrift, 9: 139.
- FORTESCUE, L. S. 1924: The Western Elburz and Persian Azerbaijan. - The Geographical Journal, 63: 301-318, sketchmap and 4 pl.
- FRIESE, H. 1911a: Neue Varietäten von *Bombus*. (Hym.) II. - Deutsche entomologische Zeitschrift, 1911: 456-457.
- FRIESE, H. 1911b: Neue Varietäten von *Bombus*. (Hym.) III. - Deutsche entomologische Zeitschrift, 1911: 571-572.
- GEOFFROY, E. L.: 1785, in FOURCROY, A. F. DE: Entomologia Parisiensis sive Catalogus Insectorum quæ in Agro Parisiensis reperiuntur; Secundum methodum Geoffræanum in sectiones, genera & species distributus: Cui addita sunt nomina trivialia & fere trecentæ novæ Species, 2: 233-544. Paris.
- KIRBY, W. 1802: Monographia Apum Angliæ; or, an attempt to divide into their natural genera and families, such species of the Linnean genus *Apis* as have been discovered in England: with descriptions and observations, 2, pp. [i], [1]-388, pl. 15-18. Ipswich; J. Raw.
- KRIECHBAUMER, J. 1870: Vier neue Hummel-Arten. - Verhandlungen der kaiserlich-königlichen zoologisch-botanischen Gesellschaft in Wien, 20: 157-160.
- LEPELETIER DE SAINT-FARGEAU, Comte A. 1833: Observations sur l'ouvrage intitulé, «Bombi Scandinaviæ Monographicè Tractati, etc., à GUSTAV. DAHLBOM. Londini Gothorum, 1832; trs.» auxquelles on a joint les caractères des genres *Bombus* et *Psithyrus*, et la description des espèces qui appartiennent au dernier. - Annales de la Société entomologique de France, 1: 366-382.
- MORAWITZ, F. F. 1881: Die russischen *Bombus*-Arten in der Sammlung der Kaiserlichen Academie der Wissenschaften. - Bulletin de l'Académie Impériale des Sciences de St. Pétersbourg, 27: 213-265, = [1883] Mélanges biologiques tirés du Bulletin de l'Académie Impériale des Sciences, 11(1): 69-144 [text reset].
- NOEL, J. B. L. 1921: A reconnaissance in the Caspian provinces of Persia. - The Geographical Journal, 57: 401-418, sketchmap, 4 pl.
- PITTIONI, B. 1937: Eine Hummelausbeute aus dem Elburs-Gebirge (Iran). - Konowia, 16: 113-129.
- POPOV, V. V. 1967: The bees (Hymenoptera, Apoidea) of Iran. - Trudy Zoologicheskogo Instituta, Akademiya Nauk Soyuz Sovetskikh Sotsialisticheskikh Respublik, 43: 184-216. [In Russian.]
- RABINO DI BORGOMALE, H. L. 1928: Mázandarán and Astarábád. - Pp. [ii]-[xxiv], [1]-[171] (English text), [1]-235 (Persian text), folding map. London; Luzac & Co. [E. J. W. GIBB Memorial, new series, 7.]
- RADOSZKOWSKY, O. 1878a: Essai d'une nouvelle méthode pour faciliter la détermination des espèces appartenant au genre *Bombus*. - Bulletin de la Société Impériale des Naturalistes de Moscou, 52 (4): 169-219.
- RADOSZKOWSKY, O. 1878b: Essai d'une nouvelle méthode pour faciliter la détermination des espèces appartenant au genre *Bombus*. Continuation. - Bulletin de la Société Impériale des Naturalistes de Moscou, 53(1): 76-95, pl. Ila, I Ib.
- RADOSZKOWSKY, O. 1881: [no title: Mittheilungen über einige neue ... von MLOKOSSEWITSCH aus dem Umgebungen von Demavend (Persien) zugesandten Hymenopteren.] - Horae Societatis Entomologicae Rossicae, 16, Bulletin: v-vi.
- RADOSZKOWSKY, O. 1883: Sur quelques espèces russes appartenant au genre *Bombus*. - Bulletin de la Société Impériale des Naturalistes de Moscou, 58(1): 168-226.
- RADOSZKOWSKY, O. 1884: Révision des armures copulatrices des mâles du genre *Bombus*. - Bulletin de la Société Impériale des Naturalistes de Moscou, 59(1): 51-92, pl. I-IV.

- RADOSZKOWSKY, O. 1888: Etudes hyménoptérologiques. I. Révision des armures copulatrices des mâles. 1) *Bombus*. - Horae Societatis Entomologicae Rossicae, 22: 315-337, pl. XII-XV.
- RASMONT, P. 1983a: Notes taxonomiques sur les bourdons (Hymenoptera, Apidae). - Bulletin & Annales de la Société Royale Belge d'Entomologie, 119: 167-170.
- RASMONT, P. 1983b: La notion d'exerge appliquée à *Megabombus* (*Thoracobombus*) *pascuorum* (SCOPOLI) (Hymenoptera, Apidae). - Bulletin & Annales de la Société Royale Belge d'Entomologie, 119: 185-195.
- REINIG, W. F. 1939: Die Hummeln der Reisen von E. PFEIFFER (1936) und E. PFEIFFER und Dr. W. FORSTER (1937) in den Elburs. - Mitteilungen der Münchner Entomologischen Gesellschaft e.V., 29: 145-148.
- RIEDL, H. 1967: Boraginaceae. In: RECHINGER, K. H. - Flora Iranica, 48: [1]-281, 48 pl.
- SCOPOLI, J. A. 1763: Entomologia Carniolica exhibens Insecta Carnioliae indigena et distributa in Ordines, Genera, Species, Varietates, Methodo Linnaeana. Pp. [xxxvi], 1-420, [421: Notanda, Errata; 423: Monitum auctoris], 43 pl. Vindobonae; Trattner.
- SEIDL, W. B. 1837: Die in Böhmen vorkommenden Hummelarten. In: WEITENWEBER, W. R., Beiträge zur gesamten Natur- und Heilwissenschaft, 2: 65-73. Prag.
- SKORIKOV, A. S. 1910a: Nouvelles formes de bourdons (Hymenoptera, Bombidae). Diagnoses préliminaires. III. - Russkoye entomologicheskoye Obozrenie, 9: 409-413. [In Russian.]
- SKORIKOV, A. S. 1910b: Notes sur la faune et la répartition géographique des bourdons au N.-Caucase. - Travaux de la Société des Naturalistes à l'Université Impériale de Kharkow, 43: 77-84. [In Russian.]
- SKORIKOV, A. S. 1938: Zoogeographische Gesetzmässigkeiten der Hummelfauna im Kaukasus, Iran und Anatolien (Hymenoptera, Bombinae). - Entomologicheskoye Obozrenie, 27: 145-151. [In Russian.]
- STARK, F. 1934a: The site of the city of Kalar in Kalar Dasht. - The Geographical Journal, 83: 211-217, sketchmap, pl.
- STARK, F. 1934b [1952]: The Valleys of the Assassins and other Persian Travels. Pp. 287. Harmondsworth; Penguin Books.
- SUTTON, S. L. n.d.: Report of the Oxford University Expedition to the South Caspian, 1961. Oxford University Exploration Club Bulletin, No. 11: [1]-24, 4 pl.
- TURRILL, W. B. 1945: Vegetation, pp. 187-209, pl. 150-160, in HARRISON, J. V.; SHERWIN-WHITE, A. N. & MASON, R., Persia. XIX + 638 pp., 337 pl., 61 fig. and maps in text, folding map. [London]; Naval Intelligence Division (Geographical Handbook Series, B.R. 525).
- VOGT, O. 1909: Studien über das Artproblem. 2. Mitteilung, Über das Variieren der Hummeln. 1. Teil. - Sitzungsberichte der Gesellschaft naturforschender Freunde zu Berlin, 1909: 28-84, pl. I.
- VOGT, O. 1911: Studien über das Artproblem. 2. Mitteilung, Über das Variieren der Hummeln. 2. Teil. (Schluß). - Sitzungsberichte der Gesellschaft naturforschender Freunde zu Berlin, 1911: 31-74.
- WILLIAMS, P. 1991: The bumble bees [sic] of the Kashmir Himalaya (Hymenoptera: Apidae, Bombini). - Bulletin of the British Museum (Natural History), Entomology Series, 60: [1]-204.

Author's address:

Dr. DONALD B. BAKER
 Hope Entomological Collections
 University Museum, Oxford OX1 3PW
 U. K.