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Korean Species of the Genus *Anarsia* (Lepidoptera, Gelechiidae)

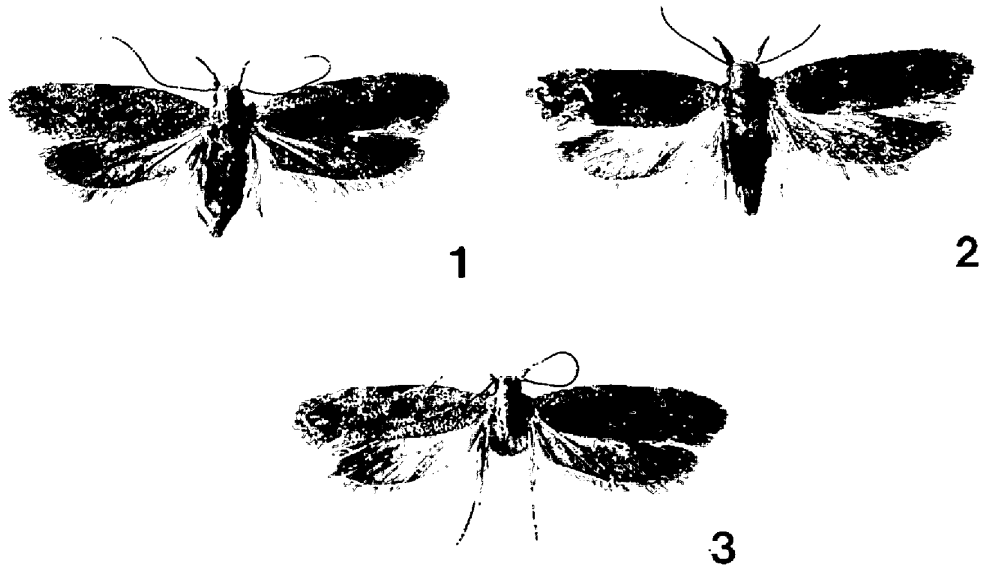
Kyu Tek PARK

Department of Agrobiology, Kangweon National University, Chuncheon, 200–701 Korea

Abstract Three species of the genus *Anarsia* in Korea are revised. Of them, a species, *A. nigricana* is described as new to science and *A. bimaculata* PONOMARENKO is reported from Korea for the first time.

Key words: *Anarsia*; Gelechiidae; Lepidoptera; new species; Korea.

The genus *Anarsia* ZELLER comprises about 90 species which are mostly distributed in the Palaearctic, Oriental and Ethiopian Regions, and a few representatives in Australia. MEYRICK (1925) and GAEDE (1937) listed five species to be distributed in the Palaearctic Region, and PONOMARENKO (1989) recently added another 13 species to that region and reported six species of the genus from USSR, including original description of a species, *A. bimaculata* PONOMARENKO. In China five species have been known throughout the area, but only one species, *A. bipinnata* (MEYRICK) has been known from Korea and Japan to date.



Figs. 1–3. Adults. —— 1, *Anarsia bipinnata* (MEYRICK), male; 2, *A. nigricana* sp. nov., female (paratype); 3, *A. bimaculata* PONOMARENKO, male.

Genus *Anarsia* ZELLER, 1839

Anarsia ZELLER, 1839, Isis, Leipzig., 1839: 190. Type species: *Tinea spartiella* SCHRANK, 1802.
Ananarsia AMSEL, 1959, Stutt. Beitr. Naturk, 28: 32. Type species: *Anarsia lineatella* ZELLER, 1839.

The genus *Anarsia* is superficially similar to the genus *Hypatima* HÜBNER, especially in having the 2nd segment of the labial palpus with an expanded ridge of loose hair-tuft anteriorly as well as a triangular tuft in the genus *Dichomeris* HÜBNER. But the genus *Anarsia* generally possesses easy distinctions as follows: erect scale-tufts on forewing well developed and terminal segment of labial palpus rudimentary or concealed in male, but normal and rather longer than or as long as 2nd segment in female, and asymmetrical valva in male genitalia. Forewing is rather broad, the termen is obliquely rounded and hindwing is more or less trapezoid, generally broader than the width of forewing. JANSE (1949) separated the genus *Anarsia* from the genus *Hypatima* by the character of CuA_1 and M_3 remote in hindwing, however I found that CuA_1 and M_3 of hindwing connate in all the known Korean species as well as in MEYRICK's description (1925: 153) for the genus *Anarsia*. Because of the asymmetrical valva in male genitalia, JANSE (1949) transferred four S. African species of the genus *Hypatima* to this genus in spite of the normal and long 3rd segment of labial palpus in male. Eventhough I have had no chance to examine these species, some further studies are needed to define the relatinship between these two genera. By the way, PONOMARENKO (1989) recently separated this genus into two subgenera, *viz.*, *Anarsia* and *Ananarsia*, of which the latter has been considered to be a synonym of *Anarsia* ZELLER by SATTLER (1973) after it was proposed as a good genus by AMSEL (1959).

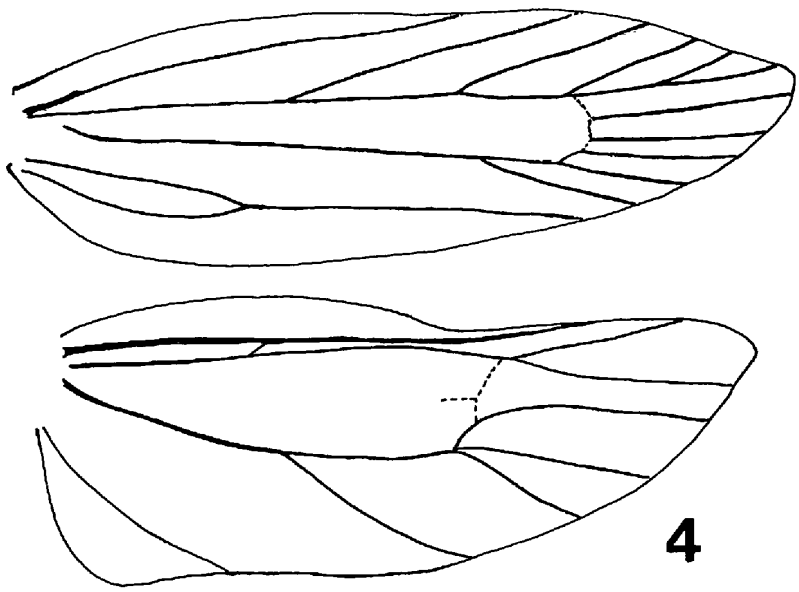
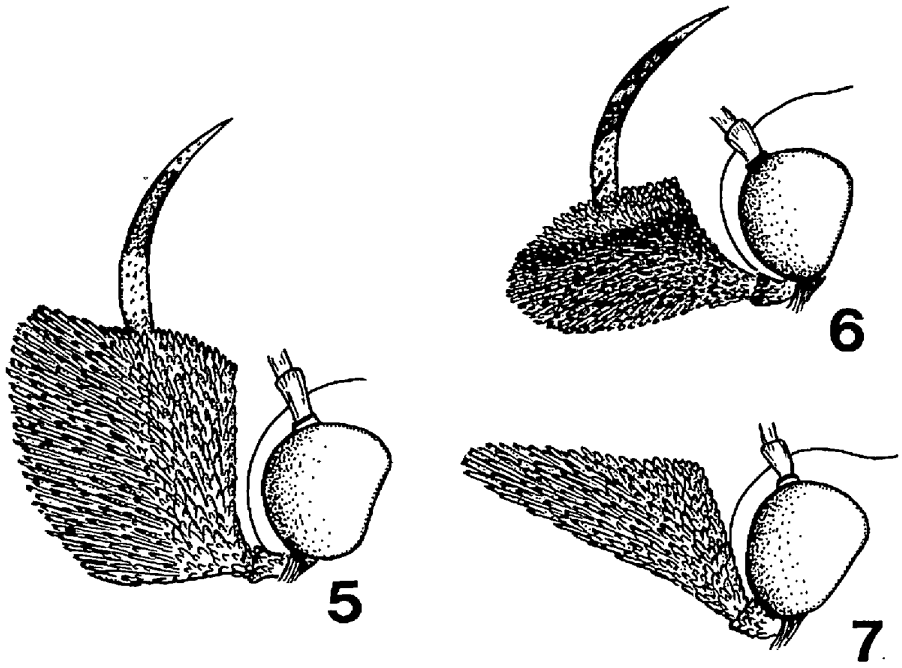


Fig. 4. Venation of *A. nigricana* sp. nov.



Figs. 5–7. Labial palpi of *Anarsia* species. —— 5, Female of *A. nigricana* sp. nov.; 6, female of *A. bipinnata* MEYRICK; 7, male of *A. bimaculata* PONOMARENKO.

Larvae of the known species are reported to feed on between spun leaves or shoots, or sometimes in fruits of host plants as the Leguminosae, Rosaceae, Anacardiaceae, Capparidaceae, Tamaricaceae, Loranthaceae, and Salicaceae (MEYRICK, 1925). The Papilionaceae and Elaeagnaceae were also cited as host plants of the genus by PONOMARENKO (1989).

1. *Anarsia bipinnata* (MEYRICK)

(Figs. 1, 6, 8–11)

Chelaria bipinnata MEYRICK, 1932, Exot. Microl., 4: 200; CLARKE, 1969, Cat. Type spec. Mirol. Brit. Mus. (Nat. Hist) by MEYRICK, 6: 409.

Anarsia bipinnata: INOUE, 1954, Check List Lep. Japan, 1: 69; ISSIKI, 1957, Icon. Het. Jap. Col. Nat., 1: 43; MORIUTI, 1982, Moths of Japan, 1/28, 2/214, pl. 13; PARK, 1983, Ins. Koreana, ser., 3: 87.

Male and female. Length 17–19 mm. Head and thorax grey. Antenna 3/4 times as long as forewing, simple, ochreous brown with dark brown ring on each segment of flagellum. Second segment of labial palpus forming narrow neck at base, dark fuscous outwardly with whitish scales on upper side and whitish grey inwardly except apical surface; terminal segment slender, rather longer than 2nd, basal 1/3 creamy white with dark fuscous oblique streak, and then forming a very

broad black band which sometimes separated into two parts, apical portion white and pointed in female, whereas rudimentary in male. Forewing yellowish grey or brownish grey suffused with dark brown scales; a distinct elongated semicircular black stigma at the middle of costa; a claviform stigma at center of cell; a small black spot near base; some other small black dots irregularly scattered. Cilia grey, short. Hindwing grey, with two bundles of long hair-pencils at base, apex rather rounded. Cilia pale grey, rather long.

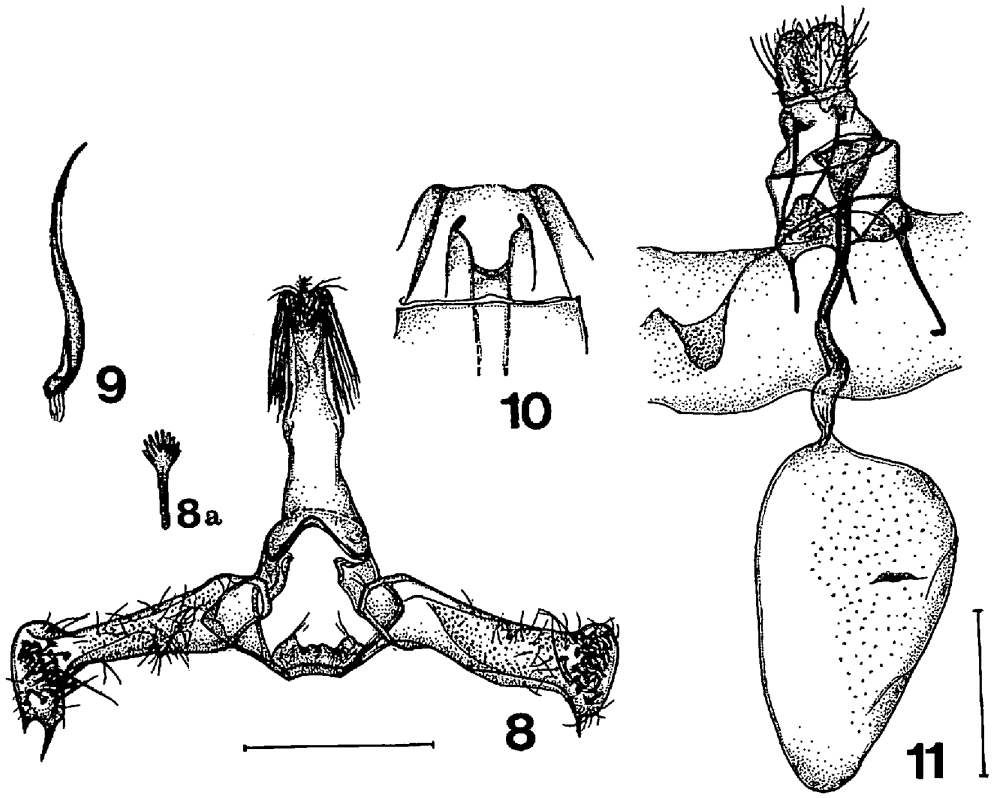
Male genitalia (Figs. 8-10). Uncus rather short, with a narrow hook-shaped process, basal area global and densely covered with long hairs. Gnathos absent. Tegumen long, 1.3 times as long as valva, dilated near middle and narrowed toward distal end, forming neck. Valva rather slender, both sides asymmetrical. Left valva widely bulged at basal half, then narrowed distally, with a triangular membraneous plate arising near middle; terminal portion widely expanded, bearing numerous characteristic scales with comb-shaped teeth, heavily chitinized zone ventrally, with a conspicuous anal projection and an additional short spine at ventro-distal end. Right valva with nearly straight costa, almost even in width but with slightly sclerotized expansion along ventral margin beyond middle; terminal portion similar to left one, but no expanded ventral chitinized portion as the left and no additional process near anal projection. Juxta emarginate at middle, with very short lobes laterally, bearing some hairs beneath the lobes. Saccus forming a wide band. Aedeagus slender, strongly tapered near middle, narrowed toward tip.

Female genitalia (Fig. 11). Papillae anales rather short, bearing strong setae along anterior margin. Apophyses posteriores about 2.5 times as long as anterior ones; dorsal plate producing very long process, as long as apophyses posteriores. Ostium rather funnel-like, posterior margin wide. Ductus bursae thin, forming narrow stripe with fine wrinkles along inner lateral surface to beyond middle. Corpus bursae very large, with a small crescent signum.

Material examined. 1♂, Suweon, Gyunggi Prov., 4 (K. T. PARK); 1♂, Suweon, 28.V.1982 (C. H. RYU); 1♂, 1♀, Suweon, 5.VI.1985 (S. B. AHN), reared from *Elaeagnus umbellata* T.; 1♂, 1♀, Suweon, 5.VI.1981 (S. W. LEE), reared from *Ageratum houstonianum* M.; 3♂, Mt. Deogyu, near Muju, Jeonbug Prov., 13.VIII.1975 (K. T. PARK), gen. slide no. 915; 1♂, 1♀, Suweon, 20.VI.1977 (K. T. PARK), gen. slide no. 930; 1♀, Gwanglung, Gyunggi Prov., 7.VIII.1986 (K. T. PARK), gen. slide no. 1738; 1♂, Gwanglung 27.VI.1986; 1♀, Gwanglung, 13.VIII.1986 (K. T. PARK); 1♂, Mt. Obang, Gyunggi Prov., 4.V.1985 (S. B. AHN), reared from *Acer ginnala* M.; 1♀, Seogwipo, Jeju Prov., IV.1985 (K. S. LEE); 2♂, Mt. Hanla, Jeju Prov., 5.VII.1986 (K. T. PARK); 1♂, Mt. Hanla, 25.V.1987 (K. T. PARK).

Distribution. Korea, Japan.

Host plants. *Elaeagus umbellata* THUN., *Ageratum houstoniaum* MILL., *Acer ginnala* MAX. and *Quercus* sp. The last two species are reported for the fist time.



Figs. 8–11. *A. bipinnata* (MEYRICK). —— 8, Male genitalia, 8 a, magnification of scales; 9, aedeagus; 10, 1st and 2nd segments of abdomen; 11, female genitalia.

Reamrks. Moths appear from the early of June to the middle of August and it seems to be univoltine in Korea.

2. *Anarsia nigricana* sp. nov.

(Figs. 2, 4, 5, 12–15)

Male. Length 16–18 mm. Head and thorax grey. Antenna simple, dark brown ring on each segment of flagellum. Second segment of labial palpus large, quadrate-shape with expanded ridge of long hair-tuft from beneath to apex, greyish brown outwardly and whitish orange inwardly; terminal segment rudimentary in male, but slightly longer than the 2nd in female, basal 1/3 whitish ochreous with a dark narrow band at middle of upper side, dark fuscous near middle, and apical 1/3 yellowish ochreous, apex acute. Forewing dark fuscous with well developed erect scale-tufts scattered irregularly; termen almost oblong. Cilia grey, speckled with dark grey, especially longer near tornus. Venation with R_1 from middle of cell; distance of R_1-R_2 longer than R_2-R_3; M_1 free; M_2 nearer to M_3; M_3

and CuA_1 separated; CuA_2 from 5/6 of cell. Hindwing with basal half of costa convex anteriorly; Rs and M_1 shortly stalked, M_2 bent toward M_3 near base; M_3 and CuA_1 connate; CuA_2 arising from near half of cell; termen strongly sinuate.

Male genitalia (Figs. 12–14). Uncus narrow, with a pointed tip, bearing dense hairs; basal area wide, densely covered with long hairs. Tegumen very long, narrowed toward distal end, distinctly dilated at distal 1/4. Valva asymmetrical; left valva nearly semiovate, slightly angled near apex, bearing a patch of erect mushroom-shaped scales at caudal portion and characteristically with a long, strongly curved, sclerotized, narrow process originated from basal 1/3 of valva, length about 1.5 times of valva; right valva broadened at basal 1/5 forming narrow neck and then gradually widened toward a distal end, costal margin nearly straight beyond basal 1/5, distal portion dilated with same kind of scales as left one, with a heavily sclerotized and curved spine-like projection originating from 3/4 of ventral margin, and a samll membraneous plate beyond the projection. Juxta with two clavate lobes laterally. Saccus short. Aedeagus slender, basal 1/3 dilated, narrowed apically with tapered tip.

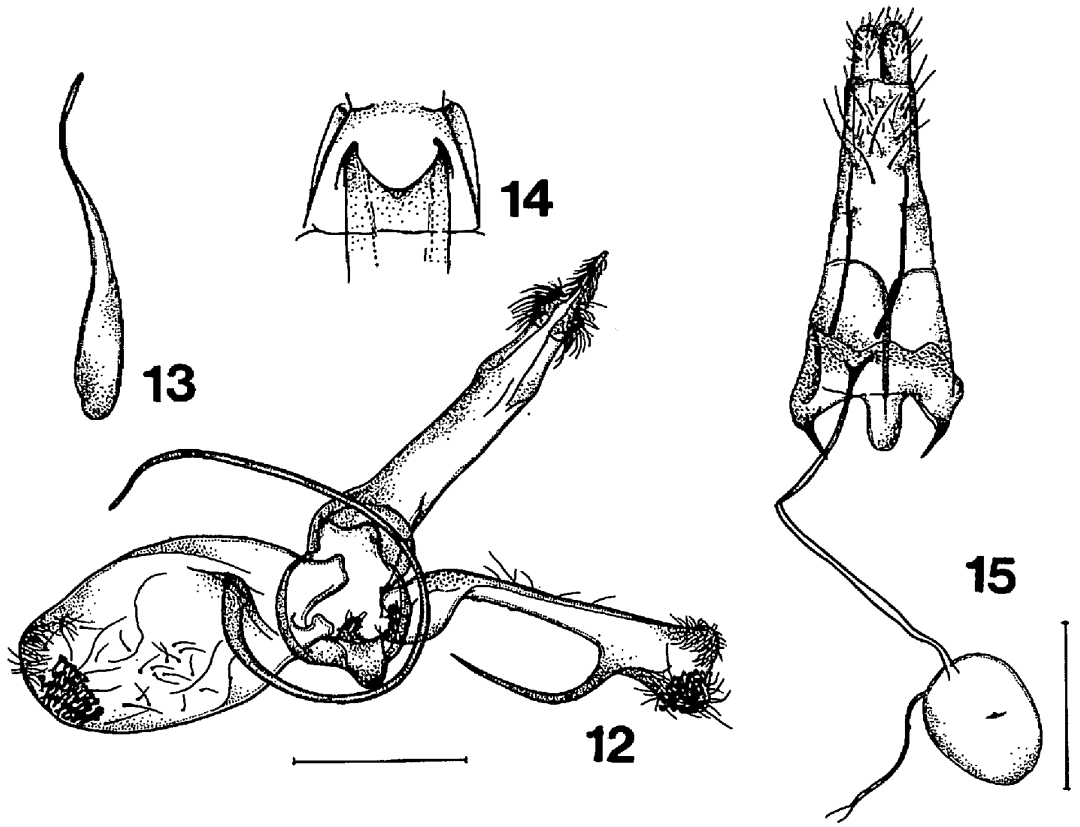
Female genitalia (Fig. 15). Very similar to those of *A. haliamodendri* CHRISTOPH and *A. bimaculata* PONOMARENKO which are known from USSR. Papillae anales long, rarely with setae. Apophyses anteriores very short, about 1/5 as long as posterior ones, dorsal plate elongate, spatulate, with rounded anterior margin (narrowed anteriorly in *A. halimodendri*) and shortly cut at end as in *A. bimaculata*. Ostium moderate, not very widened distally. Ductus bursae thin, membraneous, almost 3 times longer than length of corpus bursae. Corpusae bursae ovate with a small crescent signum.

Holotype: male, Suweon, Gyunggi Prov., 7.VII.1976 (K. T. PARK). Paratypes: 8 ♂, 1 ♀, same locality as the holotype, 7.VI.1976 (K. T. PARK), gen. slide no. 920; 9 ♂, 9 ♀, same locality as the holotype, 29.VI.1976 (K. T. PARK & C. Y. WHANG) 1 ♂, same locality as the holotype, 21.V.1976 (K. B. Uhm), reared from leaves of soybean; 26 ♂, 1 ♀, same locality as the holotype, 20.VI.1977 (K. T. PARK & J. C. PAIK), gen. slide no. 919; 2 ♂, 1 ♀, same locality as the holotype, 12–13.VII.1977 (K. T. PARK), 6 ♂, 1 ♀, Mt. Chiag, Gangwon Prov., 23.VI.1977 (K. T. PARK).

Host plant. *Glycine max* MERR.

Distribution. Korea (Central).

Remarks. I had no chance to examine the specimens of *A. halimodendri*, but this species is rather easily distinguished from the latter by the figure of forewing (PONOMARENKO, 1989: 631) in the colour pattern. Characters of genitalia of both sexes of this species are also rather similar to those of *A. halimodendri* and *A. bimaculata*, but it can be easily separated as mentioned in the description.



Figs. 12–15. *A. nigricana* sp. nov. —— 12, Male genitalia; 13, aedeagus; 14, 1st and 2nd segments of abdomen; 15, female genitalia.

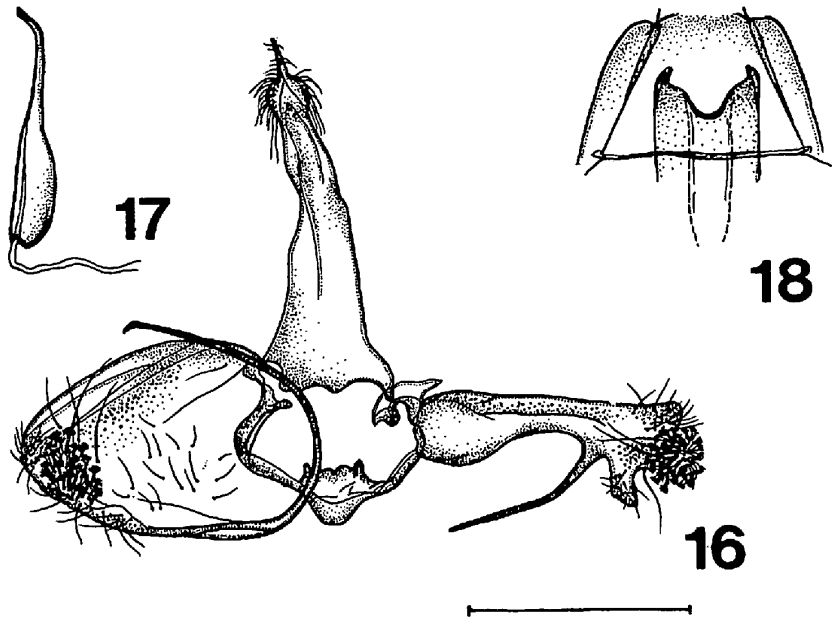
3. *Anarsia bimaculata* PONOMARENKO, 1989
(Figs. 3, 16–18)

Anarsia bimaculata PNONMAREKO, 1989, Ent. Obozr., 3: 628–640, figs. 18–21.

Male. Length 16 mm. This species is very similar to *A. bipinnata* in supersficial characters.

Second segment of labial palpus forming in elongated triangular-shape, ventral and dorsal margin nearly straight, brownish grey outwardly, with white scales along upper side of anterior half, whitish grey inwardly. Ventral surface of thorax much paler whereas dark grey in the forewing of *A. bipinnata*. Wing pattern very similar to that of *A. bipinnata*, but stigma at middle of costa rather elongate, stigma in center of cell indistinct but longer, a rather long dash-mark on cell clearly represented, and some more additional black dots scattered beneath cell. Cilia concolorous, short. Hindwing grey.

Male genitalia (Figs. 16–18). Very close to the preceding new species, *A.*



Figs. 16–18. *A. bimaculata* PONOMARENKO. —— 16, male genitalia; 17, aedeagus; 18, 1st and 2nd segments of abdomen.

nigricana, but it can be separable by following characters.

Tegumen without distinct dilation laterally; the heavily sclerotized narrow band-like process shorter and originating from ventral margin of left valva; caudal portion of right valva bearing tongue-shaped protrusion between the caudal end and the base of anal projection; juxta with rather short lobes laterally. Aedeagus dilated at basal half, then narrowed toward tip.

Female. Unknown.

Material examined. Mt. Odae, Gangwon Prov., 1♂, 26.VI.1989 (K. T. PARK), gen. slide no. 1747.

Distribution. Korea (Central), USSR.

Remarks. A few differences were observed in the male genitalia between Russian and Korean forms, especially in the shape of protrusion on ventral margin in caudal portion of right valva as follows: the protrusion of Korean form curved outwardly near middle whereas nearly straight in Russian form and a spine of the former longer than one of the latter. However, I suppose it would be a variation among individuals and I tentatively treat Korean form as conspecific to *A. bimaculata*.

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