Natural hybridization of Aeluropus lagopoides(L.) Trin. ex Thw. and Aeluropus littoralis (Gouan) parl.

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Abstract

The hybrid(A. x hybridus) between A. lagopoides and A. littoralis was found in two localities south and southeast of Hilla for the first time. Morphological, Pollen stainability and some anatomical characters were studied. The hybrid was intermeditate in morphological characteristics between the parents. The pollen stainability was relatively high.

Introduction

Aeluropus L. consists of about 3-5 species of which two species are native in Iraq. These two species (i.e.A. littoralis and A. lagopoides) are widely distributed throughout most parts of the country (Agnew, 1962; Bor, 1968). Both species are wide spread in arid places, especially salt- impregnated soils,damp places and waste land in cultivated areas, and form more or less sympatric populations in most parts of Iraq.

Natural interspecific hybrids were reported in some genera in Iraq: Verbascum (Al-Bermani & Al-musawi, 1987),Bromus (Bor, 1968), Pistacia (Jeffrey, 1980),and Vitex (Townsend, 1980).

However, natural hybrids between A. lagopoides and A. littoralis have not been reported previously.

During my study of many populations of Aeluropus, I somsetimes encountered plants of Aeluropus which seemed to be intermediate in most their characters especially the shape of inflorescences and leaves lengths, further to the plant hairiness. The preliminary examination suggested that these intermediate plants are hybrids.

Materials and Methods

In 1992 I took mass collections from sympatric populations of A. lagopoides and A.littoralis from different localities south andsoutheast of Hilla city. These were examined and voucher specimens deposited in Babylon University Herbarium. The morghological characters studied were inflorescence lengh, leaf lengh, leaf hairiness, lemma hairiness, palea apex and hairiness, and lodicule shape and hairiness, further to the vascular bundles of the lodicules.

pollen stainability:Anthers were dissected in a drop of Muntzing' s aceto- carmine/ glycerine solution (mixed equal amount of 1% aceto-carmine and neutral glycerine). The

grains were allowed to stain for 24 hr. About 500 pollen grains were scored for each in order to culculate the percentage of stained full grains.

Results and Discussion

The morphological and anatomical characters which can be used to distinguish between *A. lagopoides* and *A. littoralis* are listed in Table 1.

As can be seen from Table 1. A. lagopoides is easily distinguished from *A. littoralis* by many morphological and anatomical characters especially: the hairiness of sheath, leaves, spikelets and lodicules; leaf thickness; number of gvascular bundles for each lodicule. Therefore these characters were used for identification of hybrid.

A. lagopoides (L.) trin. ex Thw. x *A. littoralis* (Gouan) parl. = A. x hybridus Al- Bermani hybr. nov.

planta inter species dictas intermedia; culmi usque ad 30 cm alti; folia innovationum (1.2) 1.6-2.6 (3) cm longa, vaginae et folia basi cum pili sparsis; panicula densa (0.8) 1.2-3.2 (4) cm longa; lammata cum pili sparsis; palea apicem denticulates, prope basin oilis sparsis; locula bilobata, glabrae vel 1-3 pili, vel 1-2 fasciculo vasorum.

Holotypus: Janaja Village, about 20 km southeast of Hilla, 20. 8. 1992, A. K. Al-Bermani s. n. (Babylon University Herbarium).

Specimens examined: Five specimens were colleted by the author from large population of sympatric species, about 12 km south of Hilla city, 27. 9. 1992, s.n. (Babylon University Her barium).

This hybrid is distinguished from A. lagopoides by its long rhizomes, sparsely hairs on the lower partes of lemma and palea, denticulate apex of palea, presence of papillae on palea epidermis, two distinct lobes of lodicule, absence or presence of 1-3 macrohairs on the lodicule (Fig. 1,2).

It is distinguished from A. littoralis by its sparsely hairy of yong sheaths and leaves, dense panicle, hairy lemma, presence macrohairs on the lower part of palea, distinct lobes of lodicule, presence one or occasionaly two vascular bundles in the lodicule,and lodicule with 1-3 macrohairs (Fig. 1, 2).

It may be clear from the description above that natural hybrization is related to the occurence of intermediate plants. Stace (1975) pointed out that the intermediate situation is due to incomplete dominance or to polygenic inheritance. The results of this study agree with this finding.

The best morphological characters which can be used to predict the hybrids in the field are the hairiness and density of inflorescences. The hairiness of lemmas, paleas, sheaths and leaves were found to be dominant to glabrous character. The

dominance of pubescence has been reported in other hybrids of other genera such as Cyamopsis tetragonoloba (Fabaceae) by Staffard & Lewis (1975), Vulpia and Festnca (Gramineae) by Barker & Stace (1984).

Pollen Stainability: The exserted anthers at anthesis time is another character taken as evidence to recognize suspected hybrids in the field. In all the hybrids, the anthers were not exserted at anthesis and indehiscent. The anthers were usually well exserted at anthesis and dehiscent in both parents.

In order to obtain estimation of male fertiltity pollen stainability was used for this purpose. Although there is no direct evidence that fully formed and stained pollen is an in fact always viable.as in Juncus (Stace.1975)

Ten specimens belong to the two species were examined, and as expected showed good pollen grains with 75.5-98.5% stainable grains. The male fertility of the hybrids was relatively high. It is ranged from 10.3-44.5% except in one case where pollen stainability was 73.5%. On the other hand, many pollen grains were empty or partly so, and smaller than the others or misshapin.

Stace (1989) pointed out that the interspecific hybrids range from being absoultely sterile to being as fertile as either parental species. The same situation was observed in the interspecific hybrids of Hordeum (Bothmer & Jacobsen, 1986), and Festuca (Al- Bermani, 1991). Therefore, the resulte of this study in accordance with the above findings.

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الخلاصة

لقد عثر على الهجين (A.x hybridus) بين A. lagopoides و A. littoralis في موقعين في جنوب وجنوب شرق الحلة ولاول مرة . ولقد درست صفاته المورفولوجية وقابلية حبوب اللقاح على الاصطباغ وبعض الصفات التشريحية ، وظهر بان الخواص المورفولوجية كانت حالة وسطية بين الآباء واما قابلية حبوب اللقاح على الاصطباغ فقد كانت عالية نسبياً .

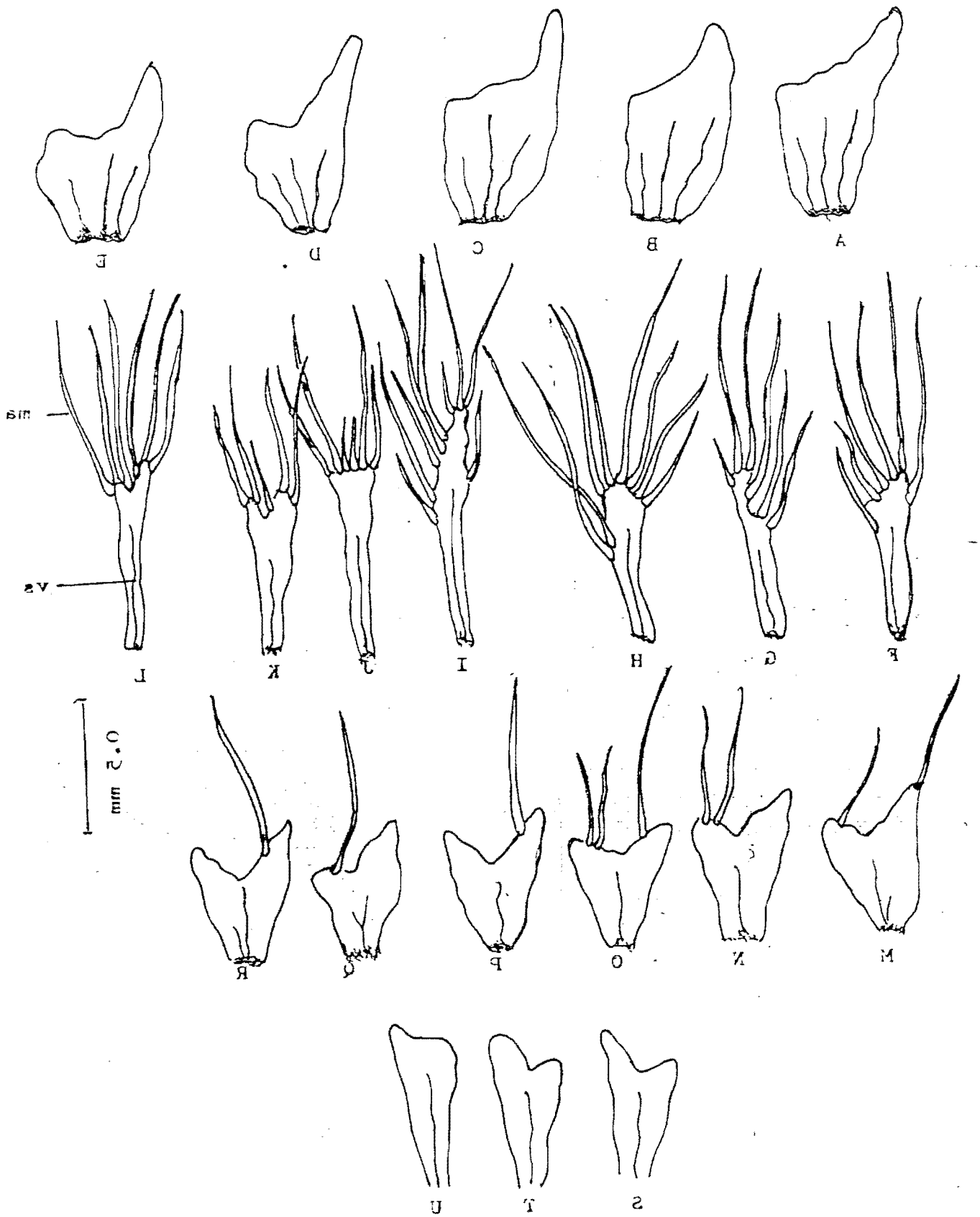
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Table 1. Comparison of morphological and anatomical characters of A. lagopoides and A. littoralis.

Character	A.lagopoides	A. littoralis
Sheath hairiness	hairy	glabrous
Leaf blade hairiness	hairy	glabrous
Leaf blade	+pungent,+rigid +congested,or spaced	usually not pungent or rigid,spaced
Inflorescence	globose,occasionally elongate	usually elongate
Spikelet hairiness	hairy	glabrous
Lemma hairiness	hairy	glabrous
Palea apex margin	entire or +wavy	denticulate
Palea aprx shape	+ rounded	rounded or emarginate
Palea papillae	absent or scarcely present	present
Prickles or hooks of palea	usually absent	present
Palea hairiness	hairy in lower part	glabrous
Palea short-cells	usually solitary	usually paired
Lodicule lobes	undistinguish	distinct
Lodicule hairiness	with macrohairs	without or with few teeth
Lodicule vascular bundles(v.b.)	with one v.b.	usaully with 3 v.b.
Leaf thickness in T.S	87.5(104)117.5 um	137.5 (182) 212.5 um
Groove depth of leaf	25(30.4)37.5 µm	75 (113) 125 µm