

DESCRIPTORS
FOR *LATHYRUS* SPP.

INTRODUCTION

The present Descriptors for *Lathyrus* L. have been prepared in accordance with the standard format of the IBPGR (presently: Bioversity International) following the recommendations on making descriptor lists for all crops contained in *Developing crop descriptor lists: Guidelines for developers* (Bioversity International, 2007). The developers have taken into account all plant character descriptors from 5 international and 5 regional descriptor lists, published earlier for various species and genera of the tribe *Fabeae* Rchb. (*Vicieae* Bronn): *Lathyrus* L., *Pisum* L., *Vicia* L. Those descriptor lists are referred to in the list of references on pages 131–134.

Presented in Russian and English, the Descriptors for *Lathyrus* spp. consist of several parts: Passport Section, Characterization and Evaluation Section, and three Appendices. The Characterization and Evaluation Section includes descriptors for morphological characters (stem, branch, leaf, inflorescence, flower, pod and seed), biological characters, economic characteristics, chemical composition, and pest and disease susceptibility. The Appendices include Latin, Russian and English names of 42 species either utilized in agricultural production or promising for cultivation; the key for their identification; and their botanical descriptions. The Passport Section was developed using *VIR Methodological Guidelines* (Vishnyakova et al., 2018). Botanical descriptions of the species reproduce those presented in *Cultivated Flora of the USSR* (1937), *Flora of the USSR* (1948), *Flora Europaea* (1968), *Flora of Turkey and East Aegean Islands* (1970), *Flora of Iraq* (1974), *Flora of China* (2010), and the results of our own efforts in plant studies at the experiment stations and branches of VIR.

The proposed format of crop descriptors should not be regarded as a peremptory model; it may be complemented by researchers in line with their missions and objectives. The structure used to describe accessions and varieties in the present publication conforms to the standards adopted by the IBPGR and functions throughout the world. It is essential as a tool for standardized evaluation of the properties and characteristics of *Lathyrus* spp. preserved in plant genetic resources collections. The plan developed to describe crop accessions will ensure their prompt and secure conservation, and facilitate the search for information on these crops in the international genebank network.

The genus *Lathyrus* includes about 150 species, which occur in warmer regions of the Old and New Worlds (Kupicha, 2002). Many of them are traditionally cultivated as food, feed, green manure, ornamental or medicinal crops. They are used most widely in the countries of North Africa, Southern, Western and Central Asia. The most important species is grass pea (*L. sativus* L.), grown in these regions for food and feed purposes (in single-species and mixed crop systems) as well as for green manure. Grass pea is recognized to be resistant to unfavorable environmental conditions, such as drought, flooding or overmoisture, etc. Plants of this species are capable of surviving where most of other crops would

perish. In the years most unfavorable for crop farming, grass pea plays a paramount role in providing food for the population in Asian and African countries. Grass pea seeds are used to cook porridge and pottage, and milled into flour. The flour is an ingredient of various dishes of national cuisines. Seeds are often cooked together with chickpea and pigeon pea. Young plants are consumed as leaf vegetables, and green pods similar to green common beans. This species is known as an excellent fodder and green manure crop.

Red pea (*L. cicera* L.), Spanish vetching (*L. clymenum* L.) and Cyprus-vetch (*L. ochrus* (L.) DC.), though less popular with farmers, are used similarly to grass pea. Sweet pea (*L. odoratus* L.), Tangier pea (*L. tingitanus* L.), everlasting pea (*L. latifolius* L.), flat pea (*L. sylvestris* L.), tuberous pea (*L. tuberosus* L.), golden pea (*L. aureus* (Steven) Brandza), Gmelin's vetchling (*L. gmelinii* Fritsch), hairy vetchling (*L. hirsutus* L.), pink vetchling (*L. roseus* Stev.), round-leaf vetchling (*L. rotundifolius* Willd.), wavy vetchling (*L. undulatus* Boiss.), spring vetchling (*L. vernus* (L.) Bernch.), covered vetchling (*L. vestitus* Nutt.), etc. are appreciated over the world as ornamental plants. All species have value as animal feed and green manure. Most of the wild species are melliferous. Meadow vetching (*L. pratensis* L.), bitter vetch (*L. linifolius* (Reichard) Bassler), grass pea, spring vetchling, flat pea, etc. are reputed as medicinal herbs. A number of the genus's representatives have edible roots (*L. tuberosus*, *L. linifolius*), which were earlier used instead of potatoes or to prepare alcoholic beverages.

Among annual and perennial crops cultivated to produce fodder, *Lathyrus* species demonstrate stable seed and herbage yield, high protein content, drought resistance, and less susceptibility to diseases and pests, such as rusts of pea (*Uromyces pisi* (Pers.) G. Winter), chickpea (*U. cicieris-arietini* Jacz.) and vetch (*U. viciae-fabae* (Pers.) J. Schröt.), and powdery mildew of field peas (*Erysiphe pisi* DC.) (Miroshnichenko, 1971; Vaz Patto et al., 2004). Protein content reaches 44.3% in seed of various *Lathyrus* spp., and 27.3% in their vegetative biomass (Smirnova-Ikonnikova et al., 1958; Burlyaeva et al., 2012). *Lathyrus* spp., when compared with other representatives of the tribe Viciae, such as peas, broad beans, lentil and vetch, manifest the highest content of water-soluble proteins (albumins) (Kudryashova, 1967).

In Russia, grass pea is cultivated in many provinces, but on small areas. Despite the vast zone of commercial cultivation, only few institutions are involved in breeding work with this species, and they do it on a limited scale, which provides a negative effect on the utilization of this high-protein crop in agricultural production. The factor that limits the crop's wide distribution is the presence of antinutrients in its seed: β -N-Oxalyldiaminopropionic acid (ODAP) and β -N-Oxalylamino-L-alanine acid (BOAA) (Campbell et al., 1994; Rodriguez-Conde et al., 2004). By now, however, cultivars with low content of these compounds have been developed in the world. Some of those cultivars are present in the collection of VIR.

All cultivated *Lathyrus* species have great potential as additional or alternative sources of protein. A number of these species are adapted to cultivation in areas with arid climate; others are resistant to overmoisture and frost, and quite a

few can survive in the environments regarded as extreme for successful production of other leguminous crops.

1. PASSPORT SECTION

1.1. Institute code (INSTCODE)

Code of the institute where the accession is maintained. The codes consist of the 3-letter ISO 3166 country code of the country where the institute is located plus a number. The current set of Institute Codes is available on the FAO website: <http://apps3.fao.org/wIEWS/>

1.2. Common crop name (CROPNAME)

Name of the crop in colloquial language, preferably English (e.g. ‘malting barley’, ‘cauliflower’).

1.3. Accession number (ACCENUMB)

This number serves as a unique identifier for accessions within a genebank collection, and is assigned when an accession is entered into the genebank collection.

1.4. Genus (GENUS)

Genus name for a taxon, in Latin.

1.5. Species (SPECIES)

Species name for a taxon, in Latin. Following abbreviation is allowed: ‘sp.’

1.6. Species authority (SPAUTHOR)

The authority for the species name.

1.7. Subtaxa (SUBTAXA)

Subtaxa can be used to store any additional taxonomic identifier, in Latin. Following abbreviations are allowed: ‘subsp.’ (for subspecies); ‘convar.’ (for convariety); ‘var.’ (for variety); ‘f.’ (for form).

1.8. Subtaxon authority (SUBTAUTHOR)

The authority for a subtaxon provided at the most detailed taxonomic level.

1.9. Hybrid (HYBRIDES)

A progeny of two or more plants belonging to different species.

1.10. Accession name (ACCENAME)

Either a registered or other formal designation given to the accession. Multiple names separated with semicolon without space.

1.11. Acquisition date (ACQDATE)

Date on which the accession entered the collection where YYYY is the year, MM is the month and DD is the day. Missing data (MM or DD) should be indicated with hyphens (e.g.: 1962----; 20160931).

1.12. Country of origin (ORIGCTY)

The name of the country where the sample was originally collected or the country code.

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