INTRODUCTION
Since disease, death and decay have always co-existed with life, the study of diseases and their treatment must also have been contemporaneous with the dawn of the human intellect. From the earliest time, man and animals have had to distinguish between those substances which are poisonous and those which are not, and thus the knowledge of naturally occurring drugs has gradually developed. Although, there is no authentic record of medicine used by the primitive man, but the 'Rig Veda', which is the oldest record in the library of man, having been written between 4500 and 1600 BC., supplicates many useful information on the subject (Kirtikar and Basu, 1933).

India, with its wide ecogeographic and climatic diversity, harbours a rich plant wealth, which has been used from time immemorial as herbal medicines for treatment of human and animal diseases. Of about 15000 species, of plants found in the Indian flora, more than 3000 species are considered to have medicinal properties of some description or the other. 

whereas, most of the Western countries in the world exclusively depend on the modern system of medicine for their health care needs, the overwhelming majority of Asian countries still rely and depend on the indigenous system of medicine.
One of the most important problems faced by these systems is adulteration and substitution. Therefore, there is an imperative need for Pharmacognostical and Chemotaxonomical standardization and authentication of herbal drugs and their galenicals which are being used by the practitioners of these systems and also by Pharmaceutical firms manufacturing herbal medicaments.

Pharmacognosy, as is well known, is an applied science which deals with biologic, biochemical and economic features of natural drugs. In a broad sense it embraces a knowledge of the history, distribution, cultivation, collection, chemical and pharmacological evaluation, preservation and survey of the marketed drugs affecting the health of men and other animals.

Chemical characters can play a vital role in plant taxonomy where the biological criterias are ambiguous and conflicting in their distribution or in those cases where 'eye ball' taxonomy is not sufficiently available. Recently Harborne (1984) has emphasised that chemical data may be useful in solving the problem of plants particularly in case of medicinal plants where only certain organs eg. root, stem, leaf, seed and fruits are available.

In the present geological period more sophisticated analytical tools viz. HPLC, GLC, GC Mass, finger printing with the help of densitometer etc. have been developed to help taxonomists and pharmacognosists in solving out the problems of identification at generic and specific level.
'Ratanjot' is popular not only in India but also in other Asian countries for imparting a pleasing red-pink colour to food stuffs, oils, fats, medicinal preparation and also used for dying silk and wool (Anonymous, 1950).

In the indigenous system of medicine, it is used for a variety of ailments, as an anthelmintic, in diseases of eye, in bronchitis, abdominal pains, itch, fever, wounds and burns etc. (Kirtikar and Basu, 1933). In the bruised form it is used as an application to eruptions and have much value in Indian veterinary medicine. It is also applied with sweet oil to wounds and used as an antiseptic. Leaves and flowers of the plant are used as stimulant and cardiac tonic (Bhandari, 1949, Chopra et al., 1956, 1958). Ethanol extract of 'Ratanjot' showed bactericidal, fungicidal and anticancer activity when put through a wide screen of biological tests. The antibiotic activity was associated with the hexane soluble fractions of the root (Bhakuni et al., 1969).

Besides its medicinal uses the 'Ratanjot' is also used as a natural vegetable colouring matter. The isohexanyl naphthazarins, present on the outer surface of the roots of at least 150 species belonging to the family Boraginaceae, are responsible for the red colour. At least twelve European countries allow its use as colorant in food and wine (Papageorgiou, 1980).
The 'Ratanjot', on the basis of its morphological characters and therapeutic values, is of three types in Indian system of medicine and of four types in Unani system of medicine, where it is described under the name 'Shanjar' (Najmul-Ghani, 1920).

The values of Sanskrit and vernacular names of plants has been much questioned by botanists for purposes of identification because similar name is applied to two or more different plant species in the same region. The botanical identity of 'Ratanjot' sold in the crude drug market all over India in the form of isolated underground part with some remains of radical leaves, is a matter of concern for the botanists, as many plant species are being sold in the market under the trade name 'Ratanjot'. The botanical authentication of market sample of 'Ratanjot' is difficult because of nonavailability of aerial parts of concerned plant species.

Bole (1961, 1962) provided a convincing explanation that the material sold in the Indian markets under the vernacular name 'Ratanjot' is derived from the plant imported into India from Kabul (Afghanistan). The equivalent vernacular name in Afghanistan for 'Ratanjot' is 'Yarlang' or 'Yella rang'. The plant species is Arnebia nobilis Rech. f. From all available informations, it becomes clear that Arnebia nobilis occurs only in Afghanistan and perhaps in some contiguous areas in West Pakistan, but not in India.
However, during the course of botanical survey and collection of plant samples for biological screening programme of the Institute for the development of new drugs from plant sources in the Himalayan region, it was observed that the roots resembling 'Ratanjot' in colour and texture were gathered by local collectors from the areas (Personal observation of Dr. Mehrotra) for commercial sale. An appearance of root and root stocks available with the local collectors clearly indicates their origin to family Boraginaceae. On enquiry they explain that they forward these roots to market. It was not possible to authenticate their samples which are devoid of aerial portions required for botanical identity. This is the common practice of any trade to find out cheap, similar looking substances for adulteration or as substitute to the genuine item for easy monetary gain. It appears that this practice started in seventies after the much publicity of 'Ratanjot' for commercial utilization for colouring 'Vanaspati Ghee' and its extended permission to use it as colouring matter for use in and upon food stuffs under the prevention of Food Adulteration Rules.

Out of eight Boraginaceous species – namely Anchusa tinctoria Linn., Arnebia nobilis Rech.f., A. benthamii (Wall.ex G.Don) Johnston, A. euchroma (Royle) Johnston, A. hispidissima DC., Maharanga emodi (Wall.) DC., Onosma hispidum Wall. and O. hookeri Clarke described by Bole (1961) under Head III (See Review for detailed information), Anchusa tinctoria, the source of European 'Alkanet', is well known in the trade and its botanical identity is also well established.
Its roots differed considerably from the market samples of 'Ratanjot'. Similarly the roots of *Arnebia hispidissima*, though having almost similar colour, but are very thin, about 0.5 cm in diameter with entirely different morphology. Therefore, it does not merit further consideration as 'Ratanjot' of commerce or adulteration in it. Now remaining five species found in India with roots having closer resemblance to one another and sometimes with market samples, are the focus of our attention for study and comparison with *Arnebia nobilis*.

With all this in view, it has been decided to reinvestigate the market samples of 'Ratanjot' and to compare these with the botanically authenticated samples collected by taxonomists from Himalayan regions and with authentic sample of root of *Arnebia nobilis*. This will enable to establish the correct botanical identity of the market sample.