Concept Paper

Vietnamese coriander (*Polygonum odorata* L): a potential underutilized spice herb of northeastern India

MUMTAK LEGO, RANJIT CHATTERJEE and BILIN MAYING*

Department of Vegetable and Spice Crops, *Department of Genetics and Plant Breeding
Uttar Banga Krishi Viswavidyalaya, Pundibari, Cooch Behar 736165 West Bengal, India
Email for correspondence: mumtaklego0@gmail.com

 Received: 25.1.2016/Accepted: 17.5.2016

ABSTRACT

The Vietnamese coriander (*Persicaria odorata* L) is a useful uderutilized leafy condiment of tropical and subtropical region immensely popular in southeast Asian countries such as Vietnam, Thailand, Malaysia and Singapore round the year with a peak season in summer for garnishing and seasoning of food. In northeastern states the crop is grown in home garden and leaves are used for garnishing local cuisine such as boiled chicken, pork and fish and in a variety of mixed vegetables. Nutritionally the leaves are rich in aromatic aldehyde and terpene compounds such as dodecanal, decanal, caryophyllene, eremophillene and alpha-curcumene which possess antibacterial properties. The leaves have wider medicinal uses and commonly utilized for treatment against digestive problems like flatulence, stomach cramps and indigestion. Thus there is an urgent need of strategies such as proper identification of existing species, identification of more wild related species, untrapped medicinal value, documentation of proper production technology, growing conditions and cultivation problem.

Keywords: Vietnamese coriander; spice herb; aromatic; medicinal value

INTRODUCTION

Vietnamese coriander (Polygonaceae) belongs to a group of fresh culinary herbs collectively known as the cilantro mimics with the cilantro flavour consisting of coriander (*Coriandrum sativum* L) and long coriander (*Eryngium foetidum* L) (Toquynh et al 2009). *Persicaria* is the new genus name which has been derived from the name of peach (*Prunus persica*) because of similar leaf shape. The earlier name *Polygonum* indicates shape of the stem which is composed of many joints linked together by slightly bent knots or knees.

The crop is mainly distributed in temperate regions but some species are found in tropical and subtropical regions (Heywood et al 2007). Hosseus (1911) reported six taxa namely *Polygonum acuminatum, P chinense, P chinense* var *ovatifolium, P glabrum, P plebeium* var *indicum* and *P roxburghii* var *longifolium*. Larsen (1961) gave an overview of Thai Polygonaceae which was intended to be a preliminary account of the family. Nine species like *P alatum, P barbatum, P chinense, P flaccidum, P glabrum, P minus, P orientale, P strigosum* and *P tomentosum* were recognized. The plant is named differently in different countries. English names include Vietnamese cilantro, Vietnamese mint and Vietnamese coriander. In Singapore and Malaysia it is called Daun Kesom or Laksa Plant, Phak Phai (Thailand and Manipur), Phak Phaew (Laos), Chi Krasang (Cambodia), Renouée Odorante (France), Vietnamesischer Koriander (German), Smartweed (English), Yuenanxiang (Chinese mandarin), Hortela-vietnamita (Portuguese). Vietnamese collectively call them as Rau Thom/Rau Ram literally translated as fragrant leaves. Rau generally refers to leafy vegetables and Thom means fragrant. In northeastern India it is mostly grown in home gardens for daily use.

Botany, ecology and constituents

The plant is native to peninsular southeast Asia and grows best in tropical and subtropical climate under warm and damp conditions. The crop is traditionally

a b

Plate 1. a) Vietnamese coriander crop (Insat: whole plant), b) Tender edible leaves

cultivated in most of the southeastern Asian countries. It can be grown well in wide variety of soils with partiallly-shaded conditions. Shaded areas produce plants with larger and greener leaves that are more marketable because of their better appearance and high aroma. The plant grows up to 15-30 cm. The stem is jointed at each leaf.It can also be grown in containers but growth is poor. Leaves are alternate, simple, entire and lanceolate with stipulated sheaths. The flowers are small and pink in color. The fruits are small achenes. A spicy-lemony-cilantro flavour is obtained from leaves. The plant is propagated through stem cuttings, by seed in home gardens or for container planting.

The main constituents in the essential oil of Vietnamese coriander are long-chain aldehydes mainly decanal (28%), dodecanal (44%) and decanol (11%). Sesquiterpenes (α-humulene, β-caryophyllene) account for about 15 per cent of the essential oil. The aroma profile of Vietnamese coriander and the composition of the volatile compounds differ depending on the place of harvest, procedure and analytical techniques used to isolate the volatile constituents.

Dung et al (1995) have studied the composition of Vietnamese herb oil isolated through steam distillation and identified 28 different volatile components of which caryophyllene (36.5%), dodecanal (11.4%) and caryophyllene oxide (8.2%) were the main ones. Hunter et al (1997) also employed steam distillation and identified 17 volatile compounds with dodecanal (44.1%) and decanal (27.7%) as the major components. Cadwallader et al (2005) used a cold direct solvent extraction method and reported that dodecanal (27.5%) and decanal (23.2%) were in highest abundance accounting for over 50 per cent of the volatile composition.

Utilization (culinary, nutritional and medicinal)

Vietnamese coriander is commonly eaten fresh in salads, meat dishes and some hot soups such as Canh Chua and stews. It withstands cooking better than coriander and imparts a subtle flavour to cooked dishes. It combines well with chillies, garlic and salad herb. It is also eaten with hot vit ion (fertilized duck egg) and the basic ingredient in the Vietnamese soup is known as Pho. Pho is a low calorie, nutritious and a typical bowl of soup that contains about 650 calories.

In most of the Asian countries it is used to season meat dishes but it is also well known for a range of medicinal and other beneficial properties due to its secondary compounds (Shavandi et al 2012). It is also one of those numerous herbs that give Vietnamese cuisine its unique touch and is often used interchangeably with cilantro herb or mint in southeastern Asian cuisine. In Cambodia cuisine leaf is used in soups, stews, salads and the Cambodian summer rolls (Naem). In Singapore and Malaysia the shredded leaf is an essential ingredient of Lksa, a spicy noodle soup, so much that the Malaya name Daun Laksa means laksa leaf. In Laos and certain parts of Thailand the leaf is eaten with raw beef Larb while in Australia the plant has been investigated as a source of essential oil.

In india the Manipur state uses this as garnishing herb over various cuisines such as Eromba and Singhu. Manipuris call it as Phak Phai. In Arunachal it is called Chayong (Adi tribe) and added as garnishing

agent in local cuisine such as boiled meat (chicken, pork and fish) and a variety of vegetables. Locally leaves are sun-dried, crushed into pieces and mixed with local made dried meat pickle as aromatic agent as it retains the flavour for long term in storage in Arunachal Pradesh.

Essential oils obtained from the leaves have a significant role in the society where it is variously used in medicine, pharmacy, cosmetics, chemical and food-processing industries (Yentema et al 2007). Essential oil was recovered from both dry and fresh leaves and it was found that essential oil from dry leaves was lower than fresh leaves because some of volatile compounds from dry leaves is vaporized in drying process. The antimicrobial properties of essential oils have been recognized for long time which have been scientifically established (Sadashiva et al 2010).

The essential oil from fresh and dry leaves of *Persicaria odorata* possesses strong antibacterial activity against gram positive bacteria namely *Staphyloccocus aureus* and gram negative bacteria such as *Escherichia coli*. Essential oil from *P odorata* leaves has been known as source of aldehyde and terpene compounds such as dodecanal, decanal, caryophyllene, eremophillene and alpha-curcumene which possess antibacterial properties (Sadashiva et al 2010).

The leaves are highly effective against digestive problems like flatulence, stomach cramps and indigestion and are extensively consumed in soups and salads in southeastern Asian countries. In Vietnam it is traditionally accepted that the leaves of this herb can be taken internally to repress excess sexual desire. It is speculated that Buddhist monks always have Vietnamese coriander herb in their garden as eating it frequently helps them to have a celibate life.

Traditional cultivation practices in northeastern region

Vietnamese coriander is available in almost every household of northeastern region almost round the year with peak season in the summer. The crop is grown with minimum care and protection in most of the home gardens. The plant is multiplied with seed or runner with the onset of summer or spring. Seed collected from previous year are broadcast in a closer spacing on raised beds around household premises for current year use whereas stem cuttings are done by detaching a healthy stem from an old healthy growth plant and planted in a new field. Sometimes planting materials are also collected from neighboring home garden or relative home.

The multiplication rate of this aromatic crop is very high and fast as well. Sufficient amount of organic manures are added as a source of plant nutrients. Watering is given at frequent intervals depending upon soil moisture condition. Naturally this leafy spice crop is fond of moist soil for growth. Harvesting of tender aromatic leaves can be started after 3-4 weeks of planting. Harvested tender shoot are cleaned and used for consumption or bundled with other leafy vegetables for local marketing purpose. Proper care is required during picking so that young plants are not harmed. Repeated harvesting of tender shoots is done for household consumption. It replaces the coriander leaves as garnishing agent in many local cuisine during festive season.

Development of proper scientific cultivation practices, identification of different species and proper marketing are the needs for widespread cultivation of this underexploited crop in rest part of the country.

Future Prospects

- Collection and documentation of the related species
- Identification and multiplication of best leaves quality cultivars
- Standardization of propagation and seed production technology
- Awareness regarding the nutritional and medicinal value of the plant among the consumers
- Standardization of improved production technology for better yield and quality
- Standardization of storage methods to maintain the freshness for longer period
- Identification of harmful diseases and pests affecting the growth and yield of the plant
- Standardization of proper marketing channel

Vietnamese coriander is an underutilized spice crop of northeastern region of India. The crop is having immense nutritional and medicinal properties; proper exploitation and utilization is urgently required. Research work on different cultivation methods and postharvest management will enhance the production and availability of the crop to wider area.

REFERENCES

Cadwallader KR, Benitez D, Pojjanapimol S, Suriyaphan O and Singh T 2005. Characteristic aroma components of the cilantro mimics. ACS Symposium Series, Vol 908, American Chemical Society, Washington, DC, pp 117-128.

Dung NX, Hac LV and Leclercq PA 1995. Volatile constituents of the aerial parts of Vietnamese *Polygonum odoratum* Lour. Journal of Essential Oil Research **7:** 339-340.

Heywood VH, Brummitt RK, Culham A and Seberg O 2007. Flowering plant families of the World. Royal Botanic Gardens, Kew Publications.

Hosseus CC 1911. Die botanischen ergebnisse meiner expedition nach Siam. Beihefte zum Botanischen Centralblatt **28:** 386-387.

Hunter MV, Brophy JJ, Ralph BJ and Bienvenu FE 1997. Composition of *Polygonum odoratum* Lour from southern Australia. Journal of Essential Oil Research **9:** 603-604

Larsen K 1961. A study in the flora of Thailand: Polygonaceae. Dansk Botanisk Arkiv **20:** 51-54.

Sadashiva CT, Sharanappa P, Remashree AB, Raghu AV, Udayan PS and Balachandran I 2010. Chemical composition and antimicrobial activity of the essential oil from bark of *Pittosporum dasycaulon* Miq. Advances in Biological Research **4(6):** 301-304.

Shavandi MA, Haddadian Z and Ismail MHS 2012. *Eryngium foetidum* L *Coriandrum sativum* and *Persicaria odorata* L: a review. Journal of Asian Scientific Research **2(8):** 410-426.

Toquynh CTT, Iijima Y, Morimitsu Y and Kubota K 2009. Aliphatic aldehyde reductase activity related to the formation of volatile alcohols in Vietnamese coriander leaves. Bioscience, Biotechnology and Biochemistry **73(3):** 641-647.

Yentema O, Alioune O and Dorosso SA 2007. Chemical composition and physical characteristic of the essential oil of *Cymbopogon schoenanthus* (L) Spreng of Burkina Faso. Journal of Applied Sciences **7(4):** 503-506.