Discussion
The present study provides scientific base and authenticity to the herbal plants utilized in the local traditional practices of Uttara Kannada District. The study throws light on the use of 380 species of plants in folk medicine. These plants belong to 93 different families. Among the reported plants, 88.9% (338 sps.) are dicots, while remaining 42 species belong to monocotelydons. In latest habit wise analysis of medicinal plants, it is found that highest drug plants are trees (354 sps.) followed by herbs (334 sps.), while shrubs (220 sps.) and climbers (127 sps.) are less represented (Hegde, 2003). The same trend has been observed in the present study, where trees (124 sps.) and herbs (85 sps.) top the list followed by shrubs (72 sps.), while remaining 57 species are climbers (Fig. 2). In the family wise distribution, Euphorbiaceae and Fabaceae are the dominant families with 20 species each. Moraceae (16 sps.), Apocynaceae, Cucurbitaceae and Rubiaceae (15 sps. each) and Asteraceae (14 sps.) are the other dominating families (Fig. 3). Again the data tallies with the earlier reports, which states that the major families with medicinal properties are Fabaceae, Poaceae, Euphorbiaceae, Asteraceae, Rubiaceae and Cucurbitaceae (Hegde, 2003). But the present data indicates poor utility of the members belonging to Poaceae. The phyto-geographical condition of the study area is such that, most of the parts are covered by evergreen to moist deciduous forests, facilitating easy availability of the higher plants rather than grasses. Thus the drugs are obtained more from the available higher plants than grasses.

The therapeutic properties of the plant parts vary chemically and thus different parts of the same plants are employed in the treatment of different
Fig. 2. Medicinal plants of Uttara Kannada- Habit wise distribution.

![Pie chart showing percentage distribution of different plant habits.]

Fig. 3. Medicinal plants of Uttara Kannada- Families representing highest number of species.

![Bar chart showing number of species in different families.]

- Euphorbiaceae: 20 species
- Fabaceae: 20 species
- Moraceae: 16 species
- Apocynaceae: 15 species
- Cucurbitaceae: 15 species
- Rubiaceae: 15 species
- Acanthaceae: 14 species
- Cassavaeaceae: 13 species
- Rutaceae: 11 species
- Solanaceae: 11 species
diseases and visa-versa. According to FRLHT the highest percentage of plant parts used is the roots (29.6 %), followed by whole plant (16.3 %), bark (13.5 %) and fruits (10.3 %), while leaves (5.8 %), stem (5.5 %) and rhizome (4.4 %) constitutes comparatively smaller parts in their utility (Hegde, 2003). In the present study also it has been evidenced that roots (26 %) are the most widely used in traditional medicine in Uttara Kannada (Fig. 4). But there is a slight change in the ranking order of the other parts, which reads as leaves (23 %) > bark (15 %) > fruit (10 %). The reduction in the use of whole plant and enhanced use of bark indicates the more use of trees and shrubs rather than herbs.

As most of the study area comes in rural area under thick forest cover, the modern medical facilities are hard to get. Thus the inhabitants are mainly depending on the herbal drugs for their discomforts and phytomedicines play an important role in their primary health care. In this context, the number of diseases is also high which are treated by the local healers. The list of discomforts ranges from common cold and fever, skin diseases and stomach disorders to chronic diseases like tuberculosis, heart diseases and even cancer. In the present study, in all, 186 types of discomforts are discussed, which also includes 23 veterinary ailments. The highest number of treatments is claimed in the treatment of skin diseases (439), while stomach disorders (280), pediatric treatments (195), fever (185) and menstrual disorders (138) are the other diseases having maximum claims. The result indicates that most of the diseases having maximum claims are common disorders, which need slight treatment in day-today life. But never
Fig. 4. Medicinal plants of Uttara Kannada- Comparative account of plant parts used in medicine.

Fig. 5. Medicinal plants of Uttara Kannada- Plants with highest claims.
the less severe ailments like diabetes (72), blood pressure (29), paralysis (56), jaundice (105) and cancer (23) also have importance in the local herbal treatment. The study also ascertains the maximum utility of the plants like Phyllanthus emblica, Embelia ribes, Ocimum sanctum, Calotropis gigantia, Moringa oleifera and Terminalia chebula in local health tradition (Fig. 5).

Along with the use of these herbal preparations in the treatment of discomforts, many of the plant species having medicinal properties are consumed by the local people in their day today diet. The edible plants like Dioscoria bulbifera, Colocasia esculenta, Remusatia vivipara as vegetables, Zingeber officinale, Curcuma longa, Murraya konigii, Piper nigrum as spices or condiments may be useful in combating as well as preventing many of the ailments. Large number of wild fruits are also consumed by the local people through out the year depending upon the season and their availability (Hebbar et. al., 2003). Thus the food also acts as medicine in many cases.

The obtained data were thoroughly crosschecked with the available literature on Indian medicinal plants and ethnobotany (Jain, 1991; Anonymous, 1995; Yoganarasimhan, 1996; Kameshwar Rao, 2000; Kirtikar and Basu, 2001). This helped in listing of hitherto new claims of plants to cure different ailments. During the present study, as much as 630 such new claims were recorded. Among them, maximum new claims are in the treatment of jaundice (51), while paralysis (29), diabetes (28) and piles (27) are the other significant ailments in the new claims.

Inspite of tremendous advancement in medical and pharmaceutical sciences and significant improvements in the living conditions of the human
beings, there are certain ailments and diseases for which satisfactory cure or management is not yet available. Cancer, tuberculosis and hepatic infections including jaundice are some such disorders. In view of this, the new claims in the treatment of liver disorders and jaundice, cancer (11) and tuberculosis (7) gains much importance as much work is going on through out the world to develop more efficient drugs for their treatment.

Even after much work and many publications in the field of ethnomedicine, there are still more work to do. This has been indicated by significantly large number of new claims. This also suggests the continuous change or shift in ethnomedical practices. There may be newer experiments in the treatment of diseases using some allied or newer plant species for more efficient results. This trend will, probably, be continued in the future also and needs continuous monitoring.

Even though, the traditional herbal system has no relation with the modern scientific screening, still many of the plants are proved to be in right use, possessing the chemical composition in accordance to the treatment. This factor has helped a lot in popularizing the traditional system again along with its fame of having very less side effects. On the contrary, traditional knowledge based studies helped to modern medicine in the development of new drugs. Numerous molecules have come out of traditional experimental base. For example, Serpentine alkaloids for hypertension from *Rauwolfia serpentina*, Psoralens in skin diseases from *Psoralia corylifolia*, Holarrhena alkaloids for amoebiasis from *Holarrhena antidysenterica*, Piperidines as bioavailability enhancers from the members of Piperaceae, Phyllanthins in antivirals from *Phyllanthus amarus*,

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Curcumine in inflammations from *Curcuma* sps. and withanolides as immunomodulators from *Withania somnifera* (Patwardhan *et. al.*, 2004). Even though, majority of these wonder drugs have been discovered in Western countries, they are from such plants, as had been used in primitive societies or in indigenous medicine of Indian system (Ved Prakash, 1998). The use of these plants in the treatment of same diseases is still popular in local healing systems. Evidently, the experimental investigation of medicinal plants used in indigenous folk medicine system can lead to many novel useful drugs, but some times modern and traditional uses may be entirely different. For example, the anti-leukamic activity of vincristine from *Vinca rosea* was found when the plant was investigated because of its folk use as a remedy for diabetes (Plotkin, 1991).

Thus the large numbers of new claims made in the present work brings up an ample of opportunities to work on drug development. The thorough chemical, physiological and clinical investigations of claims made for each plant, especially new claims, can contribute some more novel new drugs to the world.

When compared to the earlier work in the field of ethnomedicine of Uttara Kannada, the present study stands high. Earlier, Bhandary *et. al.* (1995) have reported 69 species of plants with 98 formulations used by Siddis of Uttara Kannada. During the present study, 62 of the reported species are claimed again with some new additions to their curative properties. Similarly, among the 41 species of plants reported to be used by the people of Gowli community (Bhandary *et. al.*, 1996), 34 species are being represented in the present study. Apart from this, 17 new claims for
the snakebites have been recorded in the present study in addition to those
given by Bhandary and Chandrashekar (2001), who has recorded 43 species
of plants involved in the treatment of venomous snakebites from the study
area. The present work also includes the ethnomedical knowledge of Kunabi
tribe of Uttara Kannada, which covers 45 plant species with 44 formulations
in the treatment of 24 types of discomforts (Harsha et. al., 2002). The plants
in the treatment of skin diseases from the study area is also published, which
includes 52 herbal formulations from 31 plant species including 17 new
claims to the ethnomedical knowledge (Harsha et. al., 2003).

The study, in its next part, deals with the experimental evidence to
test the efficacy of the healing herbs. Further, in an effort to find out an
alternative source for the plants from nature, efficacy of the calli from the
same plants were tested against selected microbial strains.

Among the selected plants, *Ocimum gratissimum* showed maximum
inhibitory effects on tested microorganisms (Table 2), while the other plants
were moderately active. *Streptococcus faecalis* was found to be most
sensitive to the leaf extract of *O. gratissimum*. Nakamura et. al. (1999) have
reported that *Shigella flexineri* is most sensitive to the essential oil from the
leaves of *O. gratissimum*. This proves the antimicrobial property of
*O. gratissimum*. Among the different extracts tested, chloroform extract in
its higher concentrations, was more active against *Pseudomonas aeruginosa,*
*Streptococcus faecalis* and *Escherichia.coli*, while *Bacillus subtilis* was
more sensitive to ethanol extract. As most of the earlier works have been
carried out on the essential oil, distilled in water or acetone as solvents
(Jassen et. al., 1989; Martins and Salguerio, 1999; Nakamura et. al., 1999; Dubey et. al., 2000), the extracts from the continuous solvent extraction in the study of biological activity is first of its kind.

Similarly, antifungal activity of essential oil from the leaves of *O. gratissimum* has been investigated by many workers. Lima et. al. (1993) found that the essential oil of *O. gratissimum* is most active, inhibiting the growth of 80% of the tested dermatophytic strains. He also suggests that the essential oil of *O. gratissimum* is more antifungal in nature, rather than antibacterial. Similar observations were made in the present study too, in which the recorded antifungal activity was much higher than antibacterial activity. The zone of inhibition against tested fungal strains was even higher than that of the standard. *O. gratissimum* has shown the inhibitory effect on *Trichophyton rubrum* and *T. mentagrophytes* (Nwosu and Okafor, 1995).

Recently, the antifungal nature of its essential oil was re-examined by Dubey et. al. (2000). However, there are no reports on the biological activity of the crude extracts of it. The results of the present study are very significant as the zone of inhibition of the chloroform extract was much higher than that of standard (Nystatin, 100 units/disk) for the fungal strains, *Aspergillus niger* and *Penicillium chrysogenum* (Table 3).

The antimicrobial activity of the leaf extracts, however, is because of its essential oil content (Nakamura, 1999). The chemical composition of the essential oil has been given by many workers (Oliver, 1960; Sainsbury and Sophowora, 1971; Yoganarasimhan, 1996; Pandey and Chowdhury, 2001). Nakamura (1999) suggested that, thymol may be responsible for its reported
antimicrobial action, but among the reported chemical compounds, oleanolic acid is the bioactive component present in the leaves of *O. gratissimum* (Njoku and Zeng, 1997).

Thus the usage of the leaves of *O. gratissimum* as an antiseptic and as antifungal agent by the local traditional healers can be substantiated. The other reports, apart from its antimicrobial activity, like muscle contracting lipid soluble principles (Onajobi, 1986), anti mutagenic activity (Obaseiki-Ebor *et. al.*, 1993) and anti-diarrheal activity (Ilori *et. al.*, 1996) further strengthens the proof to its usage in the traditional treatment for different ailments.

The application of leaf juice of *Centratherum anthelmintica* in the treatment of cuts and wounds by the local herbal healers indicates its probable antibacterial nature. There are very few earlier reports about the usage of its leaves in the treatment of cuts, wounds and cutaneous disorders (Yoganarasimhan, 1996), but there are no earlier reports on its antimicrobial activity.

The antimicrobial study of the leaf extract of *C. anthelminticum* showed moderate activity against bacterial strains, while no antifungal activity could be observed in any of the extracts (Table 5). The acetone extract showed significantly higher activity among the four extracts tested in all the bacterial strains, while aqueous extract showed the least activity. Similar trend has been observed in the extracts from the seeds of the same plant (Nadkarni, 1976). This might be because of the higher solubility of the active oils and resins in the solvents of lower polarity. There is no ambiguity.
about the active principle in the achenes of *C. anthelminticum*. The antiseptic and stimulant effects of the achenes on the skin are probably due to the small quantities of essential oils and resins (Anonymous, 1966). Nadkarni (1976) further confirmed the same, stating that the activity is because of the bitter resins and essential oils in the achenes. But there are no reports on the active principles present in the leaves. The bioassay-guided fractionation of the extracts from the leaves of *Vernonia colorata*, an allied plant of the same genus, revealed that vernolide and vernodalin are the novel biologically active compounds (Rabe *et al.*, 2002). Similar chromatographic and fractionation techniques would, probably, bring out few more novel antiseptic agents of therapeutic value, from the leaves of *C. anthelmintica*.

*Holigarna arnottiana*, a member of the family Anacardiaceae, is endemic to the Western Ghats (Ahmedullah and Nayar, 1986). The bark of the tree is used to treat wounds (Harsha *et al.*, 2002) and the acrid juice is applied to the skin diseases. These are the new records to the world of ethnobotany, as there are no earlier reports about its use in herbal medicine. The antimicrobial assay of the bark extract of *H. arnottiana* is also a first attempt in the study of this plant. The results revealed a moderate activity against tested bacterial strains and no zone of inhibition has been observed against fungal strains (Table 2). Maximum inhibition (11.30 mm) was in acetone extract against *E.coli* at the concentration of 250 µg/disk. Even though the acetone extracts, in all the cases, have shown significantly higher zone of inhibition, it was much lower than that of the standards in all the bacterial strains. There are no reports even, about the active principles or
bioactive compounds in *H. arnottiana*. The only available literature about the chemical composition of *H. arnottiana* is of Nair *et. al.* (1952). They have reported laccol in latex, fruit rind, kernel oil and seed coat of the plant. They have also fractionated phytosterols and glycerides of oleic, linoleic, palmitic and stearic acids from the fat of seed. The antimicrobial nature of the bark may be presumably due to the presence of oleic, palmitic and stearic acids or their derivatives, the biological activities of which have been worked out already (Richardson and Gangolli, 1996).

The ethnomedicobotanical database of the present study revealed that the leaf juice of *Allophylus cobbe* is applied externally in the treatment of wounds. The antimicrobial assay of the same has been, thus, undertaken to find out the extent of expected biological activity (Table 4). The maximum inhibition was observed in acetone extract against *Bacillus subtilis* (12.1mm) at the concentration of 250 µg/disk. Among the tested extracts, acetone extract is found to be most active against all the bacterial strains, while the antifungal activity has not been observed in any of the extracts. Even though there are only few works on the chemical composition of the plant (Yoganarasimhan, 1999; Rastogi and Mehrotra, 1999), no reports are available either about the biological activity or about the active principles of the plant. Root of the plant contains tannin, stem contains 2-sitosterol and the leaf contains benzylamide and traces of alkaloids (Yoganarasimhan, 1996). Thus, it can be predicted that the antibacterial nature may be due to the presence of these alkaloid content in the leaf.

The results of antimicrobial activities of the calli extracts of *A. cobbe* (Table 7) and *C.anthelminticum* (Table 6) have shown significantly enhanced
activity against all the tested microorganisms, in all the extracts. But again, as in case of their respective plant parts, the antifungal activity was absent in both the cases. The acetone extract from the calli of *C. anthelmintica* exhibited maximum inhibition against *E.coli* (22.4 mm). Similarly, the maximum activity of *A. cobbe* was observed in acetone extract against *Pseudomonas aeruginosa* (20.53 mm). The maximum activity in the callus was again in acetone extracts, when compared to other extracts. The least activity was observed in aqueous extracts of the both leaf as well as callus extracts.

*B. subtilis* was more sensitive to the leaf extracts of *A.cobbe*, while *P. aeruginosa* was highly sensitive to the leaf-callus extract of the same plant. The comparison of percentage inhibition of leaf extract to that of leaf callus extract in all four bacterial strains, *P. aeruginosa* (Fig. 6), *S. faecalis* (Fig. 7), *B. subtilis* (Fig. 8) and *E. coli* (Fig. 9), clearly indicates the enhanced anti-bacterial activity in leaf-callus extract. Similar enhancement in the antibacterial activity has been recorded also in leaf-callus extracts of *C. anthelmintica*. Much difference in the percentage inhibition was observed in *P. aeruginosa* (Fig. 10), while the difference is marginal in *S. faecalis* (Fig. 11). A moderate increase in the activity, however, was recorded in *B. subtilis* (Fig.12) and *E. coli* (Fig.13).

Similar trend of enhanced antibacterial activity has been observed in leaf-callus of *Bixa orellana*, while similar or slightly higher activity was recorded in the calli obtained from root and hypocotyl of the same plant, when compared to their respective plant parts (Castello *et. al.*, 2002).
Fig. 6. Effect of leaf extract and leaf-callus extract of *Allophylus cobbe* on *Pseudomonas aeruginosa*.

Fig. 7. Effect of leaf extract and leaf-callus extract of *Allophylus cobbe* on *Streptococcus faecalis*. 
Fig. 8. Effect of leaf extract and leaf-callus extract of *Allophylus cobbe* on *Bacillus subtilis*.

Fig. 9. Effect of leaf extract and leaf-callus extract of *Allophylus cobbe* on *Escherichia coli*. 
Fig. 10. Effect of leaf extract and leaf-callus extract of *Centratherum anthelminticum* on *Pseudomonas aeruginosa*.

Fig. 11. Effect of leaf extract and leaf-callus extract of *Centratherum anthelminticum* on *Streptococcus faecalis*. 
Fig. 12. Effect of leaf extract and leaf-callus extract of *Centratherum anthelminticum* on *Bacillus subtilis*.

Fig. 13. Effect of leaf extract and leaf-callus extract of *Centratherum anthelminticum* on *Escherichia coli*. 
Lakshmi et al. (1999) reported the enhancement in the inhibitory activity as well as total alkaloid content in chloroform extract from the callus of *Heterostemma tanjorense*. Nezbedova et al. (1999) found a similar variation in the secondary metabolites accumulated in the plants and in the cell cultures in the plants of two *Aphelandra* species (Acanthaceae). They also suggested that the enhancement in the activity might be due to the accumulation of active metabolites in cell lines of callus tissue. Further, their study on the accumulation of verbascoside, the major extractable metabolite, was growth dependent and positively related to the presence of 2,4-D in the medium. Thus, it can be noted that, the reduced enhancement in the activity of crude extracts from calli of *Bixa orellana* was because of the absence of 2,4-D, instead of which, NAA was used in the study (Castello et al, 2002). In contrary, much enhancement in the activity was observed in the present study, with the use of 2,4-D in the medium. Thus, the studies on callus culture extracts with high antimicrobial activity makes it a good system for further expanding this work at commercial level and using it for production of desired molecule.

Even though, most of the results are tallying with the available earlier literature, there are few exceptions in which, results may vary from the reported data. These differences can be explained by susceptibility testing conditions, physico-chemical variations of the plants and even strain-to-strain differences within the tested organisms. However, *in vivo* data and clinical trial may be helpful in determining the potential usefulness of the tested plants.
India, apart from being known for its ancient civilization and deep-rooted ethnic herbal traditions, is also known for its rich plant diversity. Among the 17,500 species of flowering plants, about 8000 plants are recognized as medicinally important (Ravikumar and Ved, 2000). Almost 12% of these flowering plants are endemic to peninsular India, which covers 1932 taxa, belonging to 108 families (Ahmedullah and Nayar, 1996). Among the 380 plant species recorded in the present study, 10 are endemic to peninsular India (Table 8, Plate 15).

Table 8. Medicinal Plants of Uttara Kannada: Plants Endemic to Peninsular India.

<table>
<thead>
<tr>
<th>Plant Name</th>
<th>Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cinnamomum wightii Meissn</td>
<td>Lauraceae</td>
</tr>
<tr>
<td>Garcinia indica (Du Petit-Thou.) Chois.</td>
<td>Clusiaceae</td>
</tr>
<tr>
<td>Wagatea spicata Dalz.</td>
<td>Caesalpiniaceae</td>
</tr>
<tr>
<td>Lagerstroemia microcarpa Wt.</td>
<td>Lythraceae</td>
</tr>
<tr>
<td>Ervatamia heyneana (Wall.) T.Cooke.</td>
<td>Apocynaceae</td>
</tr>
<tr>
<td>Jasminum malabaricum Wight.</td>
<td>Oleaceae</td>
</tr>
<tr>
<td>Wendlandia thyroidea (Roem. &amp; Sch.) Steud.</td>
<td>Rubiaceae</td>
</tr>
<tr>
<td>Holigarna arnottiana Hook.f.</td>
<td>Anacardiaceae</td>
</tr>
<tr>
<td>Ochlandra talbotii Brandis.</td>
<td>Poaceae</td>
</tr>
<tr>
<td>Ensete superbum (Roxb.) Cheeseman.</td>
<td>Musaceae</td>
</tr>
</tbody>
</table>

But this plant wealth is diminishing with rapid decline in the forest cover and loss of biodiversity. It is evident from the reports stating that, in Uttara Kannada the forest area has come down from 8,000 sq Km. to 6,000 sq Km. in about 40 years (Potter, 1996). This has been resulted in the drastic reduction in the number of individual plant species and many of the medicinal plants are now under different threat status and are red-listed. This method of red listing the threatened species provide an easily and widely understood method for highlighting those species under higher extinction risk, so as to focus attention on conservation measures designed to protect them. On the basis of their threatened status, plants are categorized in to critically endangered (A taxon facing an extremely high risk of extinction in the wild in immediate future), endangered (A taxon, not critically endangered, but facing a very high risk of extinction in the wild in near future), and vulnerable (A taxon facing a high risk of extinction in the wild in medium-time future). The present study includes 17 such plants (Table 9), which are under different threat status (Plate 16 and 17) and needs immediate action plan for their protection and conservation (Ravikumar and Ved, 2000).
<table>
<thead>
<tr>
<th>Plant Name</th>
<th>Family</th>
<th>Threatened Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cinnamomum wightii Meissn</td>
<td>Lauraceae</td>
<td>Endangered- Globally</td>
</tr>
<tr>
<td>Garcinia indica (Du Petit-Thou.) Chois.</td>
<td>Clusiaceae</td>
<td>Vulnerable- Globally</td>
</tr>
<tr>
<td>Gardenia gummifera L.f.</td>
<td>Rubiaceae</td>
<td>Vulnerable- Globally</td>
</tr>
<tr>
<td>Gloriosa superba L.</td>
<td>Liliaceae</td>
<td>Vulnerable- Karnataka</td>
</tr>
<tr>
<td>Holostemma rheedei Wall.</td>
<td>Asclepiadaceae</td>
<td>Vulnerable- Karnataka</td>
</tr>
<tr>
<td>Madhuca longifolia (Koen.) MacBride</td>
<td>Sapotaceae</td>
<td>Vulnerable- Karnataka</td>
</tr>
<tr>
<td>Michelia champaca L.</td>
<td>Magnoliaceae</td>
<td>Vulnerable- Karnataka</td>
</tr>
<tr>
<td>Nothapodytes foetida (Wt.) Sleumer.</td>
<td>Icacinaceae</td>
<td>Endangered- Karnataka</td>
</tr>
<tr>
<td>Oroxulum indicum (L.) Vent.</td>
<td>Bignoniaceae</td>
<td>Vulnerable- Karnataka</td>
</tr>
<tr>
<td>Persea macrantha (Nees.) Kost.</td>
<td>Lauraceae</td>
<td>Endangered- Karnataka</td>
</tr>
<tr>
<td>Pseudarthria viscida (L.) Wt.&amp;Am.</td>
<td>Fabaceae</td>
<td>Vulnerable- Karnataka</td>
</tr>
<tr>
<td>Rauvolfia serpentina (L.) Benth.</td>
<td>Apocynaceae</td>
<td>Endangered- Karnataka</td>
</tr>
<tr>
<td>Salacia reticulata Wight.</td>
<td>Celastraceae</td>
<td>Endangered- Karnataka</td>
</tr>
<tr>
<td>Santalum album L.</td>
<td>Santalaceae</td>
<td>Vulnerable- Karnataka</td>
</tr>
<tr>
<td>Saraca asoca (Roxb.) de Wilde.</td>
<td>Caesalpiniaceae</td>
<td>Endangered- Karnataka</td>
</tr>
<tr>
<td>Symlocos racemosa Roxb.</td>
<td>Symplocaceae</td>
<td>Vulnerable- Karnataka</td>
</tr>
</tbody>
</table>

For all the practical purposes, medicinal plants are no different from the other economically important species, which are subjected to same risks and needs same degree of protection as the other plant resources (Rao, 2000). Generally root and bark are the major source of drugs in the local medicine. The unscientific collection of these parts is harmful to the plants and contributes in its own way to lead some plant species to the red list. Thus creating awareness among local people, search for alternative medicines both from natural and synthetic sources and rapid regeneration and propagation techniques will, probably, help in the conservation of diminishing plant wealth.

Even though, pharmaceutical companies and phyto-medical industries are gaining much profits from the knowledge borrowed from the traditional herbal systems, no part of it has reached to its original source. The new laws of patenting has further made the issue more sensitive and it lead to the disputes for the ownerships of the rights over plants or the formulations even between the nations. There is a need of some laws or regulations to govern and protect the rights of the traditional healing folk. Thus came the existence of Intellectual Property Rights (IPR), which is intended to protect the rights of the original source of any particular wisdom or knowledge. General Agreements on Tariffs and Treaty (GATT), Convention on Biological Diversity (CBD) are few of such IPR regulations. Apart from the protection of rights, IPR implication can save diversity due to unavailability of it to the competitor and motivate the competitor to invest in research for new knowledge and substitutes from alternative sources (Sushil Kumar, 1995).
But major gap in our knowledge regarding its utilization and management exists in the detailed documentation and uses of medicinal plants by native communities (Arora, 1997). The present work is a step towards proper documentation of the folklore herbal remedies of Uttara Kannada, which will be helpful in protecting our rich heritage of traditional herbal healing.

Thus the present work forms a 'golden triangle' consisting of traditional knowledge, biotechnology and pharmacological screening. This provides a basic platform to the future studies in modern drug development, which will be in the interest of pharmaceutical companies, researchers and ultimately the global community to respect the tradition and build on their knowledge and experimental wisdom.