



A comparative investigation of the anti fungal properties of indigenous wild thyme *spp.* with locally distilled essential oils

(Un'investigazione comparativa delle proprietà anti fungine di specie di timo indigene e selvatiche attraverso oli essenziali distillati in loco)

| | |
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| Name of applicant: | IPO Increasing People Opportunity |
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I. THE ACTION

1. Description

1.1 Title

A comparative investigation of the anti fungal properties of indigenous wild thyme *spp.* with locally distilled essential oils

1.2 Location(s)

Ethiopia, Addis Abeba

1.3 Amount requested

| Total eligible cost of the action | Amount requested |
|-----------------------------------|------------------|
| | 22.684 EUR |

1.4 Summary

This project aims at investigating different wild species of thyme in order to promote a phytoterapic approach to cure common skin diseases through locally produced low-costs remedies. Wild *Thymus spp.* will be distilled according to their area of provenance and chemotypes will be determined. The project will aim to establish the HPLC, the MIC (minimum inhibitory concentrations) for the anti fungal activity as well as in vitro anti-inflammatory properties of thyme essential oils.

The researches will be applied to targeted children with scant access to health care, mainly located in poor urban areas of Addis Abeba. A clinic trial will start within schools collecting 500 hundred clinical cases (grade 1 to 8) to carry out the experimental phase, create reliable statistical database with EpiInfo/EpiData and establish clinic protocol and procedures in which selected nurses will be accurately trained on.

1.5 Objectives

1. To investigate on the anti fungal activity of Ethiopia wild thyme *spp.*
2. To collect clinical data and evidences

1.6 Justification

The proposal objectives have an important relevance with the needs and constraints of the poorest stratum of urban settlements which have not equitable access to medical cares, especially when the diseases are considered not fatal or simply bearable. In assigning health priorities, skin diseases are sometimes thought of, in planning terms, as small-time players in the global league of illness compared with diseases that cause significant mortality, such as HIV/AIDS (Roderick Hay, Sandra E. Bendeck and others 2005).

Ethiopia has really poor allocations in terms of dermatological cares although people and children especially suffer from skin diseases such as *tinea capitis*, *scabies*, *pediculosis*, *pyoderma*. In primary schools in western Ethiopia more than 80% of randomly examined schoolchildren had at least one skin disease. The activities foreseen want to establish strategies to promote the production of natural remedies that could be processed within the country, reducing costs and dependency from external aids together with the extensions of the incommensurable benefits derived from the available natural and spontaneous resources with which Ethiopia is well endowed. The prevalence of the use of herbal drugs in self-care was found to be 12.5% in Ethiopia (Gedif T., Hahn Hj. 2003). It is a fact that 25% of modern medicines are made from plants first used traditionally. Therefore to increase treatment rates, a viable option as such as phytotherapeutic care seems to be a strategy that worth to be evaluated.

1.7 Detailed description of activities

1. 1.1 *Essential oils samples*

After a complete survey for Thyme species collection in different agro-ecological zones (mainly in Asella, Bale mountain, Wenchi, Ankober e Debre Berhan), samples will be taken as well as in field distillation for fresh plant material will be carried out with IPO mobile distillation unit. Comparison between two types of oils (fresh/dried material) and different chemotypes will allow to characterize the essential oils.

1.2 *Essential oils analysis*

Essential oils will be analysed in Italy (UNIPAVIA) where GC/MS analysis and HPLC will determine the percentage of different chemical components in the oils. Jointly, MIC will be determined and most effective oils sorted out.

1.3 *Training on distillation technique*

Training will be delivered to communities on quality of the aromatic material (firsts rate products choice), comminution processes (understanding plant specificity, gland or sack position etc.), assembling the distillation unit (source of energy, water sealing, gravity cooling system), safety measures, collect oil from the process (yield calculation). Practical experience distilling fresh materials from plants, seeds and resins together with terms of reference for evaluating the quality and post-production will also undertaken and best practices including packaging and storing elements will be given.

1.4 *Training on skin-cream preparation*

Based on available low cost materials as such as Vaseline, lanolin and others, ointments will be prepared. The International Association for Phytotherapy will provide the expertise and preparation will be planned at community-level to make distillation plant people aware on the correct preparation of remedies with 5% essential oils.

1.5 *Training of nurses (atlas)*

Based on pharmacological findings a clinical atlas will be devised and nurses will be trained on diagnostics for the most common skin diseases treatable with thyme for which a natural treatment was discovered to be effective through UNIPAVIA's analysis. Posology will be discussed and practical application of phytotherapeutic remedies will be experienced.

2. 2.1 *Phytotherapeutic treatments and data collection*

Some schools in Addis Ketema (NW Addis Abeba) will be targeted to test new medicinal application on mycotic infection and a database with successful history and challenges will be set up with 500 clinical cases. EPIINFO/EPIDATA are standardized filing softwares with a long chain of epidemiological tools to easy the access to data. Masks for data insertion and data analysis will give a support for the dissemination of results and to lay the foundations for phytotherapeutic management of skin diseases in primary care settings of urban areas with poor economic allocation.

1.8 Duration and action plan

- The duration of the action will be 6 months.

| Activities | semester | | | | | | Implementation |
|---|----------|-----|-----|-----|-----|-----|----------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | |
| 1.1 Essential oils samples | *** | | | | | | IPO |
| 1.2 Essential oils analysis | | *** | | | | | UNIPAVIA |
| 1.3 Training on distillation technique | | | *** | *** | | | IPO |
| 1.4 Training on skin-cream preparation | | | *** | *** | | | IPO/IAP |
| 1.5 Training of nurses (atlas) | | | | *** | *** | | IPO |
| 2.1 Phytotherapeutic treatments and data collection | | | | *** | *** | *** | IPO |

2. Expected results

2.1 Expected impact on target groups

The researches will support the debate on how to provide effective treatments for all those diseases that are actually a burden for a lot of Ethiopian families without being addressed by the health sector because aren't in the big league of mortality. Thyme *spp.* have already proved to be effective in a lot of clinical trials conducted in Europe. It would be more interesting to look for an applied research that could create a natural medicine based on low cost available wild resources, in the way that a lot of families and poor communities will find the access to basic dermatological care easier and rather than an additional economic burden to low-income people this will eventually turn into a country-based alternative income generating activity. A complete information on endemic *spp.* of thyme and their essential oils properties will be available after the project as well as first clinical attempts will be made in poor schools to organize a data library with patients/students informations and reaction to treatments.

3. Budget for the action

| Expenses | Unit | # of units | Unit rate (in EUR) | Costs (in EUR) |
|--|----------------|------------|--------------------|------------------|
| 1. Human Resources | | | | |
| 1.1 Sectoral Expert (distillation) | Per month | 1,00 | 2.000,00 | 2.000,00 |
| 1.2 Abroad (staff assigned to the Action, skin-cream preparation training) | Per diem | 15,00 | 100,00 | 1.500,00 |
| Subtotal Human Resources | | | | 3.500,00 |
| 2. Travel | | | | |
| 2.1. International travel (Europe-Addis Ababa) | Per flight | 2 | 900,00 | 1.800,00 |
| 2.2 Local transportation | In the project | 10 | 100,00 | 1.000,00 |
| Subtotal Travel | | | | 2.800,00 |
| 3. Equipment and supplies | | | | |
| 3.1. Rent vehicles | Per month | 1 | 3.600,00 | 3.600,00 |
| 3.2 Distillation unit (mobile) | Per unit | 1 | 3.000,00 | 3.000,00 |
| 3.3 Equipment for distillation unit | | 1 | 500,00 | 500,00 |
| Subtotal Equipment and supplies | | | | 7.100,00 |
| 4. Local office/Action costs | | | | |
| 4.1 Other services (tel/fax, electricity/heating, maintenance) | Per month | 6 | 100,00 | 600,00 |
| 4.2 Essential oil analysis (UNIPA VIA) | n | 8 | 400,00 | 3.200,00 |
| 4.3 Phytotherapeutic treatments cream | n | 500 | 3,00 | 1.500,00 |
| 4.4 EPIINFO/EPIDATA database | Set up | 1 | 1.000,00 | 1.000,00 |
| Subtotal Local office/Action costs | | | | 5.300,00 |
| 5. Other costs, services | | | | |
| 5.1 Phytotherapeutic treatments at school | - | 1 | 2.500,00 | 2.500,00 |
| Subtotal Other costs, services | | | | 2.500,00 |
| 6. Subtotal direct costs of the Action (1-5) | | | | 21.200,00 |
| 7. Administrative costs | | | | 1.484,00 |
| 8. Total eligible costs of the Action (6+7) | | | | 22.684,00 |

4. Description of applicant

IPO is an Italian non-profit organization (APS, Associazione di Promozione Sociale, Regione Umbria, foglio 20, numero d'ordine 20 sezione b 20/06/2006 n°0099323) committed to operate in the area of the sustainable management of natural resources and related health researches and income generating activities for development. IPO is sensitive to environment biodiversity and cultural diversity, to an harmonic and compatible human pressure. IPO had started to frequent Ethiopia in 2002 laying the foundation for the project *Managing dryland natural gum and aromatic resin production to integrate pastoralists sustainable economic benefits with desertification control and biodiversity conservation* now in progress within the framework of the EU-funded FS project in Somali and Oromia Regional States.

IPO has developed a local-built new distillation unit, easy to install and operate, maximizing fuel-consumption, avoiding firewood and keeping an high rate of condensation and high-quality essential oil produced exclusively with stainless-steel machinery.

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