The Compote-Like Nutraceutical of Naqoa: A Traditional Cholagogue Agent

Parmis Badr, Forough Afsari Sardari

Abstract

The system of medieval medicine was based on the four humors (blood, yellow bile, black bile, and phlegm) theory that connected disorders to disturbance of humor balance. Herbal infusions containing fruits in a sugary solvent were one of the preferences when bile exceeded. Current study aimed to introduce the traditional nutraceutical of naqoa and analyze the formulations suited for bilious disorders. Formulations of naqoa were extracted from three main multi-component encyclopedias of Traditional Iranian pharmacy, Qarabadin Salehi, Qarabadin Kabir, and Qarabadin Azam. Fifteen compote-like formulations were selected and analyzed. The scientific names of ingredients were authenticated, and the constituents and pharmacology of highly-used ingredients were discussed. Frequent indications among 53 formulations of naqoa were fever, and bilious disorders such as hot-temperament headache, warmth in liver or stomach, and thirst. Highly-repeated ingredients in naqoa were fruits of Prunus domestica, Ziziphus jujube, Tamarindus indica, Prunus armeniaca, the flower of Viola odorata, and the manna of Alhagi maurorum. All things considered, the compote-like formulation of naqoa is a multi-fruit nutraceutical in a sugary solvent, that has been traditionally prescribed for bilious disorders as an efficient cholagogue.

Keywords: Nutraceutical; Naqoa; Cholagogue; Traditional iranian pharmacy
Introduction
The system of medieval medicine was based on the four humors (blood, yellow bile, black bile, and phlegm) theory that connected disorders to the disturbance of humor balance [1]. Yellow bile, associated with the element of fire, with warm and dry quality was thought to be secreted from liver, and the excess of yellow bile was defined as one of the characteristics for choleric temperament [2,3]. Moreover, heat-related medical condition of fever was traditionally explained through increase of bile [4]. To relieve bilious disorders, selecting the ingredients of multi-component formulations was of great importance [5]. Herbal infusions containing fruits in a sugary solvent were one of the preferences. The traditional nutraceutical of naqoa was prepared through an eight-hour steeping process, often without cooking or boiling step [6]. One example of this dosage form is mishmish naqoa (dried-apricot compote) that has been cited in a traditional Egyptian cookbook. Used after meal, this formulation improved digestion and relieved thirst [7]. Current study aimed to introduce the traditional nutraceutical of naqoa and analyze the formulations suited for bilious disorders.

Results
Concerning 53 formulations of naqoa that were mentioned in three qarabadins, frequent indications were fever, and bilious disorders (fig. 1). The analysis of fifteen bile-related formulations has been reported in table 1. Main constituents and proved effects of highly-repeated ingredients have been summarized in table 2. Figure 2 illustrates the percentage of used parts of the whole ingredients.
Table 1: Bile-related formulations of *naqoa*, the ingredients, used parts, plant families, and indications thereof [6,8,9]. Abbreviations are as follows. fr: fruit, fl: flower, m: manna, s: seed, wp: whole plant

<table>
<thead>
<tr>
<th>No.</th>
<th>Ingredients</th>
<th>Family</th>
<th>Suitable as/for</th>
<th>Ref.</th>
</tr>
</thead>
</table>
| 1   | *Prunus domestica* L. (fr)  
     *Ziziphus jujuba* Mill. (fr) | Rosaceae  
     Rhamnaceae | bilious headache | [9] |
| 2   | *Alhagi maurorum* Medik. (m)  
     *Cassia fistula* L. (fr)  
     *Cotoneaster nummularioides* Pojark. (m) | Fabaceae  
     Caesalpinaceae  
     Rosaceae | hot-temperament headache | [9] |
| 3   | *Berberis vulgaris* L. (fr)  
     *Echium amoenum* Fisch.&C.A.Mey (fl)  
     *Prunus domestica* L. (fr)  
     *Rosa × damascena* Herrm. (fl)  
     *Vitis vinifera* L. (fr) | Berberidaceae  
     Boraginaceae  
     Rosaceae  
     Rosaceae  
     Vitaceae | cholagogue | [9] |
| 4   | *Berberis vulgaris* L. (fr)  
     *Punica granatum* L. (fr)  
     *Tamarindus indica* L. (fr) | Berberidaceae  
     Lythraceae  
     Fabaceae | warmth in liver | [9] |
| 5   | *Cichorium intybus* L. (s)  
     *Nymphaea alba* L. (fr)  
     *Ribes uva-crispa* L. (fr)  
     *Rosa × damascena* Herrm. (fl)  
     *Viola odorata* L. (fl) | Asteraceae  
     Nymphaeaceae  
     Grossulariaceae  
     Rosaceae  
     Violaceae | bilious fever | [9] |
| 6   | *Cichorium intybus* L. (s)  
     *Coriandrum sativum* L. (fr)  
     *Lens culinaris* Medik. (fr)  
     *Nymphaea alba* L. (fr)  
     *Prunus armeniaca* L. (fr)  
     *Prunus domestica* L. (fr)  
     *Viola odorata* L. (fl)  
     *Ziziphus jujuba* Mill. (fr) | Asteraceae  
     Apiaceae  
     Fabaceae  
     Nymphaeaceae  
     Rosaceae  
     Rosaceae  
     Rosaceae  
     Violaceae  
     Rhamnaceae | fever | [6,8] |
| 7   | *Nymphaea alba* L. (fr)  
     *Prunus armeniaca* L. (fr)  
     *Tamarindus indica* L. (fr)  
     *Viola odorata* L. (fl)  
     *Ziziphus jujuba* Mill. (fr) | Nymphaeaceae  
     Rosaceae  
     Fabaceae  
     Violaceae  
     Rhamnaceae | bile expellant, warmth in stomach and liver | [8] |
| 8   | *Berberis vulgaris* L. (fr)  
     *Nymphaea alba* L. (fr)  
     *Prunus armeniaca* L. (fr)  
     *Prunus domestica* L. (fr)  
     *Tamarindus indica* L. (fr)  
     *Viola odorata* L. (fl)  
     *Ziziphus jujuba* Mill. (fr) | Berberidaceae  
     Nymphaeaceae  
     Rosaceae  
     Rosaceae  
     Rosaceae  
     Fabaceae  
     Violaceae  
     Rhamnaceae | bile expellant | [6,8] |
| 9   | *Alhagi maurorum* Medik. (m)  
     *Cordia myxa* L. (fr)  
     *Prunus armeniaca* L. (fr)  
     *Prunus domestica* L. (fr)  
     *Sugar*  
     *Tamarindus indica* L. (fr)  
     *Ziziphus jujuba* Mill. (fr) | Fabaceae  
     Boraginaceae  
     Rosaceae  
     Rosaceae  
     Fabaceae  
     Fabaceae  
     Rhamnaceae | bile expellant, thirst | [6,8] |
<table>
<thead>
<tr>
<th>Page</th>
<th>Plant Name</th>
<th>Family</th>
<th>Other Information</th>
</tr>
</thead>
</table>
| 10   | Alhagi maurorum Medik. (m)  
Cassia fistula L. (fr)  
Chenopodium spp. (s)  
Cordia myxa L. (fr.)  
Prunus domestica L. (fr)  
Prunus cerasus L. (fr.)  
Sugar  
Tamarindus indica L. (fr)  
Viola odorata L. (fl)  
Ziziphus jujuba Mill. (fr) | Fabaceae  
Caesalpinaceae  
Amaranthaceae  
Boraginaceae  
Rosaceae  
Rosaceae  
-  
Fabaceae  
Violaceae  
Rhamnaceae | bilious fever, cholagogue |
| 11   | Alhagi maurorum Medik. (m)  
Cassia fistula L. (fr)  
Cordia myxa L. (fr.)  
Coriandrum sativum L. (fr)  
Cuscuta monogyna Vahl. (wp)  
Prunus domestica L. (fr)  
Tamarindus indica L. (fr)  
Viola odorata L. (fl)  
Ziziphus jujuba Mill. (fr) | Fabaceae  
Asteraceae  
Boraginaceae  
Apiaceae  
Convolvulaceae  
Rosaceae  
Fabaceae  
Vitacea  
Rhamnaceae | bilious headache, cholagogue |
| 12   | Alhagi maurorum Medik. (m)  
Cichorium intybus L. (s)  
Cordia myxa L. (fr.)  
Coriandrum sativum L. (fr)  
Cuscuta monogyna Vahl. (wp)  
Prunus domestica L. (fr)  
Tamarindus indica L. (fr)  
Vitis vinifera L. (fl)  
Ziziphus jujuba Mill. (fr) | Fabaceae  
Asteraceae  
Boraginaceae  
Apiaceae  
Convolvulaceae  
Rosaceae  
Fabaceae  
Vitacea  
Rhamnaceae | severe fever, warmth in liver |
| 13   | Ficus carica L. (fr.)  
Phoenix dactylifera L. (fr.)  
Prunus armeniaca L. (fr)  
Prunus domestica L. (fr)  
Prunus dulcis (Mill.) D.A.Webb (fr)  
Prunus persica (L.) Batsch (fr)  
Vitis vinifera L. (fr) | Moraceae  
Arecaceae  
Rosaceae  
Rosaceae  
Rosaceae  
Rosaceae  
Rosaceae  
Vitacea | fever, warmth in liver |
| 14   | Alhagi maurorum Medik. (m)  
Cotoneaster nummularioides Pojark. (m)  
Prunus domestica L. (fr)  
Tamarindus indica L. (fr) | Fabaceae  
Rosaceae  
Rosaceae  
Fabaceae | cholagogue |
| 15   | Alhagi maurorum Medik. (m)  
Cassia fistula L. (fr)  
Cordia myxa L. (fr.)  
Prunus domestica L. (fr)  
Prunus dulcis (Mill.) D.A.Webb (fr)  
Spinacia oleracea L. (s.)  
Sugar  
Tamarindus indica L. (fr)  
Viola odorata L. (fl)  
Ziziphus jujuba Mill. (fr) | Fabaceae  
Caesalpinaceae  
Boraginaceae  
Rosaceae  
Rosaceae  
Amaranthaceae  
-  
Fabaceae  
Violaceae  
Rhamnaceae | bilious fever, cholagogue |
Discussion
The formulation of naqoa is a traditional nutraceutical that contains various fruits in a sugary syrup. Based on figure 1, the most frequent applications are bile-related, so this multi-fruit infusion can be introduced as a cholangogue agent. These formulations can be effective on fever, bilious headache, warmth in liver or stomach, and thirst. Moreover, half of them expels excessive amounts of bile from body (table 1). The formulation of naqoa is either simple having two ingredients like number 1 or more complicated such as number 10 and 15. Highly-repeated ingredients in naqoa are fruits of Prunus domestica, Ziziphus jujuba, Tamarindus indica, Prunus armeniaca, the flower of Viola odorata, and the manna of Alhagi maurorum (table 2). It is proved that some of them are antipyretic and laxative. Main constituents responsible for these two effects are polyphenols, fiber, mucilage, and different types of sugar such as sucrose, glucose, and fructose [14-22]. The fruit of Tamarindus indica, and the manna of Alhagi maurorum lower the level of bilirubin by reducing its intestinal-liver cycle, therefore, they are prescribed in jaundice [17, 23]. Proportions of used parts of plants in bile-related formulations are as follows: fruit 72%, flower 12%, manna 10%, seed 5%, and the whole plant 1%. According to natural philosophy, fruits like Prunus domestica, Tamarindus indica, and Prunus armeniaca are dominant in element of water meaning they have a light-density quality that leads to reacting against fire element or bilious disorders [24]. The role of manna in formulations of naqoa is purgation. Two laxatives, Alhagi maurorum and Cotoneaster nummularioides, remove bile from body, so they have been suggested in cases of hot temperament and fever [10]. All things considered, the compote-like formulation of naqoa is a multi-fruit nutraceutical in a sugary solvent, that has been traditionally prescribed for bilious disorders as an efficient cholangogue.

Conflict of Interest
None.

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References
[3] Vogel HG. Similarities between various systems of traditional medicine, considerations for the future of ethno-
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