INTRODUCTION

A nut spreads after the winter weather via small mammals, birds and human relocation. There are two types of nuts cultivated in all over the world i.e. tree nuts and peanuts. Naturally tree nuts are dry fruits with one seed like almonds, hazelnuts, walnuts etc. Almonds, hazelnuts, walnuts, Brazil nuts, pine nuts and pistachios are communal & required edible tree nut. Hazel nuts are rich source of proteins, carbohydrates, unsaturated fatty acid, vitamins and essential minerals. They are used as a human food since primitive days and have been cultivated at least since Roman times. Peanuts is an examples of groundnuts, have a parallel nutrient outline like tree nuts (Welna et al, 2008; Hu et al,1999; Vaughan et al, 1998, Brufau et al, 2006; Ros et al, 2006).

The genus Corylus, source of hazel nut contains a wide variety of deciduous shrub and tree species that are important components of many moderate forests across the Northern Hemisphere. It is widely distributed in Europe & Asia (Fig 1) (Peltre et al, 1988; Caligiani et al, 2014; Sabeti et al, 2006, FAOSTAT et al, 2006; Demir et al, 2000).

Biology of Corylusavellana

The word hazelnut is derived from the Anglo-Saxon word haesel (bonnet). Hazelnut is a member of genus Corylus, species avellana a and belongs to family Betulaceae (Table 1). It is a multi-stemmed shrubs, 3-10 m tall, have weeping or twisted branches. Leaves are quite differing in their thickness and branching bulk. Average lengths of leaves are5-10 cm with different shape, oval to round. Nuts develop in bunches of 1-12, generally in shape of spherical or oval. Particular nut is covered in double layered shell. Maturity of nuts takes minimum 7 - 8 months after fertilization.

The floral biology of hazelnut is distinct from other plantation crops. Unlike other cultivated plant, hazelnut plants are diploid (2n = 2x = 22), hermaphrodite, air-pollinated and flowering in midwinter, from December to March in the Northern hemisphere. Pollen tubes grow to the base of the styles and rest in the ovary becomes mature in the spring. Fertilization occurs when the nut is about one-half of the mature size (Amaral, 2006; Bennet et al, 1991; Smolyaninova, 1936, Kasapligil, 1972; Thompson et al, 1996).

Economically as well as commercially, maximum hazelnut cultivars are from Europe in the present era. In spite of its superior quality, production, larger sizeand thinner shells, it cannot resist the severe winters & eastern filbert blight fungal disease (Rushforth, 1999, Boccacci and Botta, 2009, Palme and Vendramin, 2002, Chenab Industries).

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Chemical Constituents

Hazelnuts are good source of fats like other nuts i.e. almond, cashew etc. The lipid fraction forming the major part of hazelnuts is composed of non polar and polar constituents. Triacylglycerols are the major nonpolar lipids representing nearly 100% of the total nonpolar lipids in hazelnut oil. It is good source of monounsaturated fatty acid (MUFA) & polyunsaturated fatty acid (PUFA). It contains predominately palmitic acid, Steracic acid, linoleic acid & linolenic acid. The omega-3 fatty acids are not synthesized by the human body. It is obtained exclusively from the diet. α-linolenic acid is precursor for omega-3 fatty acids. Hazelnut is good source of fats like other nuts i.e. almond, cashew etc.

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Table 2: Composition of Phytoconstituents in 100gm edible part of Hazelnut

<table>
<thead>
<tr>
<th>S. No</th>
<th>Phytoconstituent</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Protein</td>
<td>14.95 g</td>
</tr>
<tr>
<td>2</td>
<td>Total lipid</td>
<td>60.75 g</td>
</tr>
<tr>
<td>3</td>
<td>Carbohydrate</td>
<td>16.70 g</td>
</tr>
<tr>
<td>4</td>
<td>Fiber (Total dietary)</td>
<td>9.70 g</td>
</tr>
<tr>
<td>5</td>
<td>Iron</td>
<td>4.70 mg</td>
</tr>
<tr>
<td>6</td>
<td>Magnesium</td>
<td>163 mg</td>
</tr>
<tr>
<td>7</td>
<td>Zinc</td>
<td>2.45 mg</td>
</tr>
<tr>
<td>8</td>
<td>Copper</td>
<td>1.72 mg</td>
</tr>
<tr>
<td>9</td>
<td>Selenium</td>
<td>4 μg</td>
</tr>
<tr>
<td>10</td>
<td>Vitamin E</td>
<td>15.18 g</td>
</tr>
<tr>
<td>11</td>
<td>Lysine</td>
<td>0.42 g</td>
</tr>
<tr>
<td>12</td>
<td>Arginine</td>
<td>2.21 g</td>
</tr>
<tr>
<td>13</td>
<td>Saturated</td>
<td>4.46 g</td>
</tr>
<tr>
<td>14</td>
<td>MUFA</td>
<td>45.67 g</td>
</tr>
<tr>
<td>15</td>
<td>PUFA</td>
<td>7.92 g</td>
</tr>
<tr>
<td>16</td>
<td>Phytosterol</td>
<td>96 mg</td>
</tr>
</tbody>
</table>

Uses

Hazelnut oil decreases the cholesterol level in blood and also controls adverse effects of hypertension (Durak, 1999, Boshtam et al, 2002, Xu and Hanna, 2009, Tey et al, 2011). The presence of MUFA and PUFA in hazelnut is good for healthy heart. Daily diet of hazelnut satisfactory decrease High Density Lipoprotein (HDL) & increase Low Density Lipoprotein (LDL) in the blood plasma. Phenolic components of hazelnut reduced the MDA level & increase antioxidant activity in plasma. These factors directly alter the plasma lipid profile in the body. Hazelnut can be further evaluated for cure & prevention of heart disease (Durak, 1999, Orem et al, 2008). As a rich source of minerals like potassium, phosphorus, calcium, magnesium, copper, manganese and selenium, hazelnut is effective remedy to maintain a healthy nerve function & other body system balanced (Ozdemir et al, 2001, Ozkutlu et al, 2011).

This plant has a venotonic action being used on varicose veins and edema caused by venous inadequacy (Riethmuller et al., 2013).

Antimutagenecity and anticancer activity of fresh hazelnut were evaluated strong with respect of positive control sodium azide (as a carcinogenic compound), while dried hazelnut potential was moderate. In future hazelnut can be used as aspects of anticancer drug (Masoumi et al, 2014, Venkateswaran et al, 2002, Haewen & John, 2011).
Some evidence indicates that it helps to reduce the risk of type 2 diabetes (Dhein et al. 2003). α-Tocopherol may also be protective against intellectual deterioration and Alzheimer’s disease (Martin, 2003). Hazelnuts also used in cosmetics product & pharmaceuticals. Hazelnuts oil also used in massaging & cooking (Kornstriner et al, 2013).

Hazelnuts are widely used in the food industry such as chocolate, confectionery and baking, ice-cream, dairy products and can be added to a wide array of dishes from cereals and breads, to yogurts, soups, salads, and from main dishes to confections (Costa et al, 2013, Fallico et al, 2003). Nutella is a brand of sweetened hazelnut cocoa spread (Nutella).

Filbert one is the principal flavor compound of hazelnuts. It is used in perfumery as generally recognized as safe (GRAS) for use in foods (Zarbin et al, 1998).

CONCLUSION

Green vegetable, fruits & non-vegetarian meal are mostly included in Indian culture. But nut is randomly involved in our daily meal. Different studies emphasize that hazelnuts are rich in fatty acids & regular intake of hazelnut decreases the risk of heart disease. It is also used in treatment of other diseases and also in preparation of biodiesels & cosmetics products. We can conclude that hazel nut is very beneficial for human being.

References

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