Physical characterization of fruits

The axial dimensions of fruits were measured with a caliper and ruler. The fruits were weighed on an analytical balance (Sartorius Quintix 513-1S; 0.001 g). The various constituents of fruits (peel, pulp, and seeds) were separated and weighted.

Chemical analysis

The moisture content is determined by drying the fresh fruits in an oven Memmert SLE 400 at 65°C until constant weight was reached (AOAC 2000) [7]. The pH is measured by a pH meter (CORNING), at 20°C (AFNOR, 1984) [8]. The titratable acidity is measured according to the AOAC method (2000) [7]. The soluble solids content is determined by measuring the Brix at 20°C using a digital refractometer, Reichert type, AR200 (AFNOR, 1984) [8]. Ash was determined by combustion of the sample in a muffle furnace at 550°C for 5 h (AOAC, 1995) [9].

The total soluble sugar content was examined using phenol-sulfuric acid colorimetric method using a spectrophotometer (UV–VIS, Shimadzu) [10]. The total nitrogen content was determined by the micro-Kjeldahl method (AOAC, 2000) [7]. The soluble solids content is determined by a 9-point Hedonic scale.

Sensory analysis

Sensory evaluation was carried out by 10 panelists using a 9-point Hedonic scale where (1) disliked extremely, (2) disliked very much, (3) disliked moderately, (4) disliked, (5) neither liked nor disliked, (6) liked, (7) liked moderately, (8) liked very much, and (9) liked extremely.
Table 1: Physical characterization of the fruits

| Characteristic | Fruit Timgad (FT) | Fruit Elkseur (FE) | References |
|---------------|-------------------|-------------------|------------|
| Moisture (%)  | 80.6±2.80         | 84.3±5.80         | 84.0–90.0 [16] |
| Pectin (mg/g) | 3.72±0.30         | 2.28±0.41         | /          |
| pH            | 6.03±0.05         | 6.14±0.05         | 5.30–7.10 |
| °Brix %       | 13.0±0.5          | 12.0±0.5          | 12.0–17.0 |
| Titratable acidity (g/100 g) | 0.31±0.01 | 0.18±0.01 | 0.30–0.40 |
| Total sugars (g/100 g) | 12.2±0.51 | 9.75±0.19 | 10.0–17.0 [17] |
| Reducing sugars (g/100 g) | 6.73±0.40 | 3.61±0.22 | 4.00–14.0 [17] |
| Sucrose (g/100 g) | 5.50±0.45 | 5.94±0.17 | /          |
| Ash (g/100 g)  | 0.60±0.12         | 0.34±0.08         | 0.30–10 [17] |
| Fats (g/100 g) | trace             | 0.36±0.02         | 0.09–0.70 [17] |
| Protéines (g/l) | 1.02±0.07     | 1.19±0.01         | 0.26–1.60 [17] |
| Fiber (g/100 g) | 3.42±0.46         | 1.77±0.62         | 0.02–3.15 [17] |

Table 2: Physicochemical characterization of fruits

Table 3: Physicochemical characterization of jams

| Characteristic | Jam Timgad (JT) | Jam Elkseur (JE) | Jam industrial (JI) | References |
|---------------|----------------|------------------|---------------------|------------|
| Moisture (%)  | 30.4±1.04      | 32.4±1.12        | 71.8±1.07           | 30.0–35.0 [18] |
| Pectin (mg/g) | 17.1±0.18      | 16.0±0.2         | 12.0±0.27           | /          |
| pH            | 3.34±0.02      | 4.10±0.10        | 3.48±0.01           | 3.00–3.50 [19] |
| °Brix %       | 5.95±0.26      | 62±0.1           | 27±0.3              | 65.0–67.0 [19] |
| Titratable acidity (g/100 g) | 1.81±0.12 | 1.42±0.18        | 2.90±0.18           | /          |
| Total sugars (g/100 g) | 53.7±1.92 | 46.4±1.1 | 23.2±1.95           | 65.0–70.0 [18] |
| Reducing sugars (g/100 g) | 8.57±1.25 | 12.8±1.25        | 16.8±1.25           | /          |
| Sucrose (g/100 g) | 45.1±1.31 | 31.8±0.17       | 6.14±0.21           | /          |
| Ash (g/100 g)  | 0.56±0.02      | 0.25±0.01        | 0.12±0.005          | /          |
| Fats (g/100 g) | trace           | 1.91±0.06        | 0.24±0.03           | /          |
| Protéines (mg/l) | 4.47±0.16     | 8.95±0.31        | 2.11±0.26           | 300 [18] |
| Fiber (g/100 g) | 13.34±0.75     | 22.6±0.5         | 22.9±0.1            | 1.10 [20] |
Table 4: pH, °Brix %, and titratable acidity of jams, after 21 days, at room temperature

| Parameters          | J. Tingad (JT) | J. Elkseur (JE) | J. Roumais (JI) |
|---------------------|----------------|-----------------|-----------------|
| pH                  | 3.42±0.08      | 4.14±0.02       | 3.48±0.01       |
| °Brix %             | 60.00±0.30     | 62.35±0.20      | 27.00±0.22      |
| Titratable acidity (g/100g) | 1.84±0.02 | 1.45±0.01 | 2.90±0.02 |

Table 5: Sensory characteristic of jams

| Parameters | J. Tingad (JT) | J. Elkseur (JE) | J. Roumais (JI) |
|------------|----------------|-----------------|-----------------|
| Color      | 8.10±1.43      | 6.62±1.40       | 7.22±1.20       |
| Taste      | 7.89±0.09      | 5.81±1.22       | 7.44±0.65       |
| Odor       | 8.20±0.31      | 6.64±0.57       | 7.98±0.88       |
| Texture    | 7.50±0.68      | 8.30±0.42       | 5.23±1.36       |

CONFLICTS OF INTEREST
No conflicts of interest.

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