**Abstract**

A new variety of coriander (*Coriandrum sativum* L.), Gujarat Coriander 3 (GCo 3) was tested under 12 trials for 6 years across the country. Under Gujarat climatic conditions, GCo 3 had recorded 1501.32 kg/ha seed yield, which was 17.00 per cent higher seed yield than check variety Gujarat Coriander 2 (GCo 2). New variety is having excellent aroma in seeds due to 8.36 per cent higher linalool content (72.16%) than that of check variety GCo 2 (66.59 %). In respect to total volatile oil, GCo 3 was exhibited 4.84, 20.72 and 3.31 per cent higher volatile oil against Hissar Anand, Rcr-728 and G.Co 2, respectively. Against biotic stress new variety was found tolerant than any other check variety. Due to all above salient feature variety was recommended for release in Gujarat state.

**Keywords**
Linalool content, Gujarat Coriander 3 and ISSR marker

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**Introduction**

Coriander (*Coriandrum sativum* L.) is commonly known as *dhana* in Gujarati and *dhania* in hindi belongs to the family *Apiaceae*. During 2015-16, India has produced 3.14 Lakh tones of coriander seeds from 4.47 lakh hectors with productivity of 703 kg/ha. During same year, it was grown in 0.88 lakh hectors in Gujarat state which produced 1.38 Lakh tones with productivity of 1566 kg/ha. In Gujarat state, during the year 2015-16 the area and production of coriander was increased to 330 per cent as compare to the year 2010-11 (Director of Horticulture report, GoG, 2015-16). From curry powder 4.01 crore rupees revenue generated in the year 2013-14 (Spice Board of India 2015-16). Linalool is naturally occurring terpene alcohol present in coriander. Coriander containing high linalool is always demanding by exporter to make curry powder. Gujarat Coriander 3 (GCo 3) a new coriander variety was recommended for release after 28 years in Gujarat state. A new variety is having excellent aroma in seed due to 8.36 percent higher linalool content in seed than that of Gujarat coriander 2 (State check variety). New variety GCo 3 was tested as a code Jcr-404 under 12 trials for 6 years across the country and recorded 1668.14 kg/ha seed yield, which
was 14.91 per cent and 24.91 per cent over two respective national checks *i.e.* Hissar Anand and Rcr 728. New culture was exhibited 1501.32 kg/ha seed yield which was 17.0 per cent higher than that of state check variety. In addition to this, Gco 3 was performed seven times, nine times and five times significantly superior over check varieties *viz.* Hissar Anand, Rcr 728 and GC 2, respectively. With new culture 16.36 per cent more volatile oil yield (lt./ha) was harvested due to 3.31 per cent higher volatile oil content (%) and 17.0 per cent higher seeds yield than that of best check variety GCo 2. Newly developed variety was also found less prone to major pests and diseases during the year of testing. GCo 3 will be new choice for coriander growing farmer in the state of Gujarat.

**Materials and Methods**

**Field evaluation**

Gujarat coriander 3 (GCo 3) was tested as a code name Jcr 404. It was rigorously tested under station trials, state level trials and national trials from 2008-09 to 2014-15 at four locations across the country. For field evaluation standard Randomized Block Design (RBD) were followed. Weighted mean for seed yield over different checks varieties were calculated to find out superiority of Gujarat Coriander 3 over check varieties.

**Volatile Oil (%)**

Volatile oil from coriander seeds was extracted by using distillation method (Modified Clevenger method). Weighted accurately 50 g of coriander seeds to yield 2 to 5 ml of oil and transfer quantitatively to flask using water if necessary. About 500 ml of water was added. If magnetic stirring is to be used, insert stirring bar. Assembled apparatus selecting the trap depending upon the density of the oil to be trapped. Heat the flask to boiling and maintaining a reflux of one to two drops per second. Refluxed until two consecutive reading took at 1 hour interval showed on change of oil volume in the trap. Cooled to 20°C by allowing to stand. Calculated volatile oil (%) by using following formula

\[
\text{Volatile oil (\%) (v/w)} = \frac{\text{Vol of Oil (ml) @ 20°C}}{\text{Wt. of sample (g)}} \times 100
\]

**Linalool content (%)**

The linalool oil was extracted from air-dried powdered material (50g) in glass clavenger-type distillation apparatus and subjecting the material by using a method following Polish Pharmacopoeia VI guidelines (2002) and subjecting the material to hydro distillation for three hours. The extracted essential oil was stored in a dark glass container at a temperature of -10°C, until the time of chromatographic separation. Qualitative and quantitative analysis of the coriander linalool oil was performed using aITQ 700 GC-MS (Thermo Fisher Scientific) GC-MS instrument.

**Molecular marker study**

**Genomic DNA extraction in coriander**

The fresh leaf material of 100 mg were collected, frozen with liquid nitrogen and stored in -80 °C until use. DNA was extracted with CTAB method (Khanuja *et al.*, 1999). Briefly, 1 g of leaf tissue was ground in liquid nitrogen by using pre-chilled mortar and pestle and transferred the material in to 15 mL tube. To the ground material 5 mL of CTAB extraction buffer was added and incubated at 60 °C for 1 hour with occasional mixing. Equal volume of chloroform: Isopropanol (1:1) mixture added and mixed well by inverting for 15 min. Centrifuged at 12000
rpm for 10 min and the aqueous layer was collected. The chromosomal DNA was collected by adding 1 mL of isoamylalcohol and kept at 15 min at room temperature. Centrifuged and the pellet transferred to a clean tube and air dried for 10 min. DNA was dissolved in 2 mL of TE buffer (Tris HCL 10 mM, EDTA 1.0 mM pH 8) and incubated at 60 °C for 10 min which will dissolve DNA and inactivate DNase. 10 µL of 10 mg/mL RNase solution was added. This mixture was thoroughly mixed by inversion and incubated at 30 °C for 30 min. To this mixture 2 mL of chloroform: Isoamyl alcohol (1:1) was added and centrifuged at 12000 rpm for 10 min. The supernatant was discarded and the precipitate washed with 70% ethanol. Then the pellet was air dried and re-dissolved in 50 µL of TE buffer. Quality and quantity of DNA were checked by spectrophotometric and integrity checked by running gel electrophoresis (Fig. 2). Samples were diluted to obtain a final concentration of 20 ng per 1 µL. Extraction buffer was prepared just before use. 2-β mercaptoethanol and PVP are freshly prepared.

**PCR amplification for ISSR markers**

For ISSR primers, according to primer base composition, annealing temperature were found to vary. Therefore, for each primer annealing temperature was standardized. PCR mixture for ISSR analysis contained 40 ng of genomic DNA, 1x PCR buffer, 200 mM dNTP, primers and 1U of Taq polymerase. PCR conditions were 94 °C for 4 min. 40 cycles of 1 min denaturation, 1 min at 2 °C of annealing temperature specified for each primer, 2 min extension at 72°C and final extension for 10 min at 72°C.

| Sr. No | Primers | Primer Sequence | Total No. of bands | Polymorphic | % of Polymorphism |
|-------|---------|-----------------|-------------------|-------------|------------------|
| 1     | ISSR 17 | CACACACACACACACACAAA | 6                 | 5           | 83.33            |
| 2     | ISSR 86 | ACACACACACACACACACC | 8                 | 7           | 87.50            |

**Results and Discussion**

**Yield its attributes and quality parameter**

The culture Gujarat Coriander 3 (Gco 3) formally named as a Jcr 404 was collection from local market of Dahod Area, seed material was maintained and purified for three years and then proposed to PET trial. GCo3 has been tested under 12 trials for 6 years across the country. In Gujarat it was tested in two different Agro-climatic zone at Jagudan (North Gujarat) and Navsari (South Gujarat). Considering tow locations during six years, the average seed yield of GCo 3 was recorded 1501.32 kg/ha against 1293.21 kg /ha seed yield of state check variety Gujarat Coriander 2 (GCo 2). New variety had 17.0 per cent higher seed yield than state check variety. Among six trials at Jagudan, GCo 3 was exhibited collectively four times significantly higher yield against national and state check varieties. At North Gujarat (Jagudan) GCo3 had recorded 1843.83 kg seed yield, which was 9.58 per cent higher than superior check viz., GCo 2. New variety was found superior and stable at south gujarat (Navsari) location. It was performed significantly superior over national and state check varieties during three consecutive years (2012-13 to 2014-15) and recorded 1158.81 kg/ ha seed yield against 883.74 kg/ha against GCo 2, there was 31.12 per cent seed yield increment depicted by GCo 3.
Table.1 Mean Seed yield (kg/ha) of proposed variety (Jcr 404) in various trials over years

| Name of Trial/s | Year/s   | Locations    | Jcr 404 | Check varieties | % Increase over checks | CD@ 5% | C.V. % |
|-----------------|----------|--------------|---------|----------------|------------------------|--------|--------|
|                 |          |              |         |                |                        |        |        |
|                 |          |              |         |                | Hissar Anand | Rcr 728 | GCo 2  | Hissar Anand | Rcr 728 | GCo 2  |        |        |
| [A] Performance of Jcr-404 in North Gujarat State (Jagudan) |          |              |         |                |                        |        |        |
| PET(IET)        | 2008-09@ | North Gujarat (Jagudan) | 832.00 | .. | .. | 755.00 | .. | .. | 10.20 | 141.00 | 13.83 |        |        |
| SSVT(IET)       | 2009-10  |              | 2891.00 | .. | .. | 2406.00 | .. | .. | 20.16 | NS     | 15.04 |        |        |
| LSVT(IET)       | 2010-11  |              | 1848.00 | .. | .. | 1574.00 | .. | .. | 17.41 | 230.00 | 07.74 |        |        |
| LSVT(IET)       | 2011-12  |              | 1105.00 | .. | .. | 1432.00 | .. | .. | -22.84 | 248.00 | 11.78 |        |        |
| Mean            |          |              | 1948.00 | .. | .. | 1804.00 | .. | .. | 4.91  | 185.50 | --   |        |        |
| National trial (CVT) |      | North Gujarat (Jagudan) | 1448.00† | 1206.00 | 832.00 | 1328.00 | 20.07 | 44.95 | 9.04  | 185.00 | 8.51  |        |        |
| 2012-13         |          |              | 1514.00**# | 1102.00 | 806.00 | 1287.00 | 37.39 | 36.72 | 17.64 | 205.00 | 10.80 |        |        |
| 2013-14         |          |              | 2257.00†* | 1827.00 | 1123.00 | 2069.00 | 23.54 | 62.69 | 9.09  | 349.00 | 11.34 |        |        |
| Mean            |          |              | 1739.67 | 1378.33 | 920.33 | 1561.33 | 27.00 | 48.12 | 11.42 | 246.33 | --   |        |        |
| Mean of Check varieties (A) |      |              | 1378.33 | 920.33 | 1682.67 |        |        |        |
| Mean (Jcr-404) / Weighted mean (Jcr-404) against respective checks (A) |      |              | 1843.83 | 1739.67 | 1739.67 | 1843.83 |        |        |
| % increase against respective checks |      |              | 26.22 | 89.03 | 9.58 |        |        |        |
| [B] Performance of Jcr-404 in South Gujarat State (Navsari) |      |              |        |        |        |        |        |
| National trial (CVT) |      | South Gujarat (Navsari) | 1220.25**# | 837.53 | 746.67 | 901.23 | 45.70 | 63.43 | 35.40 | 131.87 | 10.14 |        |        |
| 2012-13         |          |              | 1231.48**# | 888.89 | 780.86 | 922.84 | 38.54 | 57.71 | 33.44 | 134.27 | 11.37 |        |        |
| 2013-14         |          |              | 1024.69**# | 1043.21 | 753.09 | 827.16 | -1.78 | 36.06 | 23.88 | 96.78  | 06.85 |        |        |
| Mean            |          |              | 1158.81 | 923.21 | 760.21 | 883.74 | 25.52 | 52.43 | 31.12 | 73.96  | --   |        |        |
| Mean of Check varieties (B) |      |              | 923.21 | 760.21 | 883.74 |        |        |        |
| Mean (Jcr-404) / Weighted mean (Jcr-404) against respective checks (B) |      |              | 1158.81 | 1158.81 | 1158.81 | 1158.81 |        |        |
| % increase against respective checks |      |              | 25.52 | 52.43 | 31.12 |        |        |        |
| Mean of Check varieties (A+B) |      |              | 1150.77 | 840.27 | 1283.21 |        |        |        |
| Mean (Jcr-404) / Weighted mean (Jcr-404) against respective checks (A+B) |      |              | 1501.32 | 1449.24 | 1449.24 | 1501.32 |        |        |
| % increase against respective checks |      |              | 25.94 | 72.47 | 17.00 |        |        |        |
| No. of trial frequency (Gujarat) |      |              | 9 | 6 | 6 | 9 |        |        |
| No. of frequency in superiority |      |              | 5/6 | 6/6 | 5/9 |        |        |        |

Note: @ = Data of 2008-09 (PET/IET) not considered due to below state average yield
Under line figures represents weighted mean of proposed culture Jcr 404 against respective checks
*, † and # are indicating significant over Hisar Anand, Rcr 728 and GCo 2, respectively

Continued...
**Name of Trial/s** | **Year/s** | **Locations** | **Jcr 404** | **Check varieties** | **% Increase over checks** | **CD@ 5%** | **C.V. %**
---|---|---|---|---|---|---|---
National trial (CVT)s | | **Hissar (Haryana)** | 1825.10† | 1761.70 | 1560.10 | .. | 3.60 | 16.99 | .. | 69.40 | 12.48
| 2012-13 | | | 1849.40† | 1852.70 | 1734.60 | .. | -0.18 | 6.62 | .. | 51.80 | 14.54
| 2013-14 | | | 1806.50* | 1735.20 | 1872.60 | .. | 4.11 | -3.53 | .. | 60.50 | 13.25
| 2014-15 | | Mean | 1827.00 | 1783.20 | 1722.43 | .. | 2.46 | 6.07 | .. | 60.57 | --
National trial (CVT) | | **Jobner (Rajasthan)** | 1958.33 | 1842.59 | 1912.04 | .. | 6.28 | 2.42 | .. | 402.88 | 12.70
| 2012-13 | | | 1513.89† | 1305.56 | 1143.52 | .. | 15.96 | 32.39 | .. | 207.12 | 10.77
| 2013-14 | | | 2368.98 | 2085.19 | 2760.65 | .. | 13.61 | -14.19 | .. | 384.90 | 10.19
| 2014-15 | | Mean | 1947.07 | 1744.45 | 1938.74 | .. | 11.62 | 0.43 | .. | 331.63 | --
Mean of check varieties (C) | | | 1763.82 | 1830.59 | | | | | | | |
Mean (Jcr-404)/ Weighted mean (Jcr-404) against respective checks (C) | | | 1887.03 | 1887.03 | 1887.03 | | | | | | |
% increase against respective checks | | | 6.99 | 3.08 | | | | | | | |
Frequency of significant over respective checks in rest of India | | | 2 Times | 3Times | | | | | | | |
No of Trial frequency (C) | | | 6 | 6 | 6 | | | | | | |
Over all Mean of Check varieties (A+B+C) | | | 1457.30 | 1335.43 | 1283.21 | | | | | | |
Over all mean/ weighted mean of Jcr-404 against respective checks(A+B+C) | | | 1694.18 | 1668.14 | 1668.14 | 1501.32 | | | | | |
% increase against respective checks | | | 14.47 | 24.91 | 17.00 | | | | | | |
Total No. of Trial Frequency (A+B+C) | | | 15 | 12 | 12 | 9 | | | | | |
No. of frequency in superiority (A+B+C) | | | 7/12 | 9/12 | 5/9 | | | | | | |

† and # are indicating significant over Hissar Anand, Rcr 728 and GCo 2, respectively.

**Source:** Annual reports and AICRPS reports
### Table 2 Mean performance of volatile oil content (%) and volatile oil yield (l/ha) of Jcr 404

| Name of Trial/s          | Year/s    | Locations | Jcr 404 | Check Varieties | % increase over checks (IOC) |
|--------------------------|-----------|-----------|---------|-----------------|-----------------------------|
|                          |           |           |         | Hissar Anand    | Rcr 728 | GCo 2 | Hissar Anand | Rcr 728 | GCo 2 |
| Volatile oil Per cent (%)|           |           |         |                 |         |       |             |         |       |
| National trial (CVT)     | 2012-13   | Jagudan   | 0.47    | 0.59            | 0.42    | 0.52  | -20.34       | 40.48   | -9.62 |
|                          | 2013-14   |           | 0.55    | 0.55            | 0.46    | 0.50  | 0.00         | 19.57   | 10.00 |
|                          | 2014-15   |           | 0.54    | 0.50            | 0.48    | 0.49  | 8.00         | 4.17    | 10.20 |
|                          | Mean      |           | 0.52    | 0.55            | 0.45    | 0.50  | -4.11        | 21.40   | 3.31  |
|                          | 2012-13   | Jobner    | 0.54    | 0.42            | 0.30    | ..    | 28.57        | 80.00   | ..    |
|                          | 2013-14   |           | 0.52    | 0.50            | 0.52    | ..    | 4.00         | 0.00    | ..    |
|                          | 2014-15   |           | 0.41    | 0.33            | 0.33    | ..    | 24.24        | 24.24   | ..    |
|                          | Mean      |           | 0.49    | 0.42            | 0.38    | ..    | 17.60        | 27.83   | ..    |
| Mean of Check varieties  |           |           | 0.49    | 0.48            | 0.42    | 0.50  | ..           | ..      | ..    |
| Mean (Jcr-404) /Weighted mean (Jcr 404) against respective checks (A) | | | 0.51 | 0.51 | 0.51 | 0.52 | .. | .. | .. |
| % increase against respective checks | | | 4.84 | 20.72 | 3.31 | .. | .. | .. |
| No. of Trials            |           |           | 6       | 6               | 6       | 3     | ..           | ..      | ..    |
| Volatile Oil Yield (L/ha)|           |           |         |                 |         |       |             |         |       |
| National Trial(CVT)      | 2012-13   | Jobner    | 10.64   | 7.74            | 5.80    | ..    | 37.47        | 83.45   | ..    |
|                          | 2013-14   |           | 7.82    | 6.53            | 6.10    | ..    | 19.75        | 28.20   | ..    |
|                          | 2014-15   |           | 9.79    | 6.95            | 6.26    | ..    | 40.86        | 56.39   | ..    |
|                          | Mean      |           | 9.42    | 7.07            | 6.05    | ..    | 33.13        | 55.56   | ..    |
|                          | 2012-13   | Jagudan   | 6.81    | 7.12            | 3.49    | 6.91  | -4.34        | 94.79   | -1.45 |
|                          | 2013-14   |           | 8.33    | 6.06            | 3.71    | 6.44  | 37.39        | 124.57  | 29.40 |
|                          | 2014-15   |           | 12.19   | 9.14            | 5.39    | 10.14 | 33.42        | 126.12  | 20.22 |
|                          | Mean      |           | 9.11    | 7.44            | 4.20    | ..    | 22.46        | 116.97  | 16.36 |
| Mean of check varieties  |           |           | 7.26    | 5.13            | 7.83    | ..    | ..           | ..      | ..    |
| Mean (Jcr-404) /Weighted mean (Jcr 404) against respective checks | | | 9.26 | 9.26 | 9.26 | 9.11 | .. | .. | .. |
| % increase against respective checks | | | 27.66 | 80.71 | 16.36 | .. | .. | .. |
| No. Of Trials            |           |           | 6       | 6               | 6       | 3     | ..           | ..      | ..    |
Table 3 Test results for linalool content (% w/w) in Gujarat Coriander 3

| Variety | Lab ID       | R-I   | R-II  | R-III  | Average    |
|---------|--------------|-------|-------|--------|------------|
| GCo3    | Co/2016/40-1 | 73.15 | 72.28 | 71.05  | 72.16±1.06 |
| GCo2    | Co/2016/40-1 | 64.77 | 66.41 | 66.61  | 66.60±1.8  |

Table 4 Ancillary characters of proposed variety Jcr 404

| Traits                  | Jcr 404 | Hissar Anand | Rcr 728 | GCo 2 | % increase over checks | S.Em. | C.D @ 5% |
|-------------------------|---------|--------------|---------|-------|------------------------|-------|----------|
|                         |         |              |         |       |                        |       |          |
| Days to 50% Flowering   | 54.33   | 58.33        | 66.33   | 55.33 | -6.86                  | -18.09| -1.81    |
| Maturity Days           | 113.00  | 115.00       | 121.67  | 114.33| -1.74                  | -7.12 | -1.17    | 0.59     | 1.72     |
| Branch/ Plant           | 7.23    | 5.73         | 5.10    | 5.97  | 26.16                  | 41.83 | 21.23    | 0.17     | 0.50     |
| Umbel/ Plant            | 28.53   | 23.50        | 17.67   | 23.67 | 21.42                  | 61.51 | 20.56    | 1.11     | 3.23     |
| Umbellate/Umbel         | 6.93    | 6.10         | 5.90    | 6.47  | 13.66                  | 17.51 | 7.22     | 0.21     | 0.62     |
| Seeds/Umbellate         | 8.80    | 6.53         | 9.17    | 8.57  | 34.69                  | -4.00 | 2.72     | 0.36     | 1.04     |
| Seeds/Umbel             | 55.23   | 40.50        | 52.97   | 49.85 | 36.38                  | 4.28  | 10.80    | 2.61     | 7.65     |
| Test wt. (gm)           | 10.82   | 10.97        | 7.39    | 10.35 | -1.39                  | 46.37 | 4.56     | 0.14     | 0.40     |

Table 5 Reaction against major pests and diseases of proposed variety Jcr 404

| Pests                  | Genotype | Mean Aphid Index For Three Years | 2012-13 | 2013-14 | 2014-15 | Total | Mean |
|------------------------|----------|---------------------------------|---------|---------|---------|-------|------|
| Powdery Mildew         | Jcr 404  | 0.64                            | 0.48    | 0.74    | 1.84    | 0.62  |
| Powdery Mildew         | GCo 2 (Ch)| 1.68                            | 1.63    | 1.47    | 4.48    | 1.59  |

Disease

| Stem gall infestation for three years |
|---------------------------------------|
| Genotype | 2012-13 | 2013-14 | 2014-15 | 2012-13 | 2013-14 | 2014-15 |
|----------|---------|---------|---------|---------|---------|---------|
| Jcr 404  | 15.10   | 11.25   | 9.50    | 0.00    | 0.00    | 0.00    |
| GCo 2 (Ch)| 30.26   | 21.00   | 19.70   | 0.00    | 0.00    | 0.00    |
Linalool – terpene alcohol, compound with anti-inflammatory, antimicrobial and sedative properties

Genomic DNA of Coriander

ISSR profile of three different coriander cultivars amplified with ISSR primers AAU-CEB-ISSR 17 & AAU-CEB-ISSR 86

Under Co-ordinated Varietal Trial (CVT), GCo 3 was tested for three years at different locations including three states viz., Gujarat, Rajasthan and Haryana. During two consecutive years (2012-13 and 2013-14), GCo 3 was performed significantly superior over national checks (Hissar Anand and Rcr 728) in four trials at Hissar (Haryana) and Jobner (Rajasthan). Considering overall performance across three states, GCo 3 was found 14.47, 24.91 and 17.00 per cent superior over check varieties Hissar Anand, Rcr 728 and GCo 2, respectively (Table 1). In respect to volatile oil content (%), Gujarat Coriander 3 found 4.84, 20.72 and 3.31 per cent superior than two national checks and state check varieties, respectively. In connection to this, during the years of experiments, GCo 3 was reported 9.26 lt/ha volatile oil yield which was 27.66, 80.71 and 16.36 per cent higher than that of Hissar Anand (7.26 lt.), Rcr 728 (5.13 lt.) and GCo 2 (7.83 lt.), respectively (Table 2). Linalool is natural occurring alkaloids synthesize in coriander seeds, which is responsible for fragrance in coriander seed. Excellent aroma
presents in seeds of GCo 3, due to 8.36 per cent higher linalool content (72.16%) than that of check variety GCo 2 (66.59 %) (Table 3 and Fig. 1). A variety GCo 3 least infected by aphid and marginal infestation of powdery mildew was found during the years of testing under co-ordinated trials (Table 4).

Molecular studies

Two ISSR primer viz., ISSR-17 and ISSR -86 were finally screen for detection of variability among three cultivar of coriander which includes new release variety Gujarat Coriander 3 and two checks (GCo 1 and GCo 2). Primer ISSR 17 and ISSR 86 had reported 83.33 and 87.50 per cent polymorphism. Reproducibility of both primers were also occurred with high frequency. A distinguished fragment of 3000 bp appeared in Gujarat coriander 3 only, which signifies that, the cultivar under study is having enough genetic distance than that of both reference varieties (Figure 3).

Seed yield is not a single character but it is conglomerate of many characters, ancillary observation like branches per plant, Umbel/ Plant, Umbellate/Umbel, Seeds/Umbellate, Seeds/Umbel and Test wt. (gm) are directly influences on seed yield. Gujarat Coriander 3 variety is found superior for all these characters than that of check varieties (Islam et al., 2003; Dyulgerov et al., 2013; Mert et al., 1998). In respect to earliness, variety GCo3 was found quite early maturing than all three check varieties, because of early maturity escape mechanism may play role for major diseases and pests are concern. The variety GCo3 may tolerant to aphid and powdery mildew due to early maturity (Table 4 and 5). The variety is having purple colour pigmentation in pollen and petals of flowers. This is one of DUS (Distinguished Uniform and Stable) character to identify variety, the purple pigmentation may also responsible for synthesise high amount of linalool in seed at maturity (Meena et al., 2013 and Renata et al., 1998). Coriander variety with white pollen and petal has always recorded lower linalool than that coriander variety with purple pollen and petal (Dyulgerov et al., 2013).

Under molecular examination, Primer ISSR 17 and ISSR 86 had exhibited more than 80 per cent polymorphism. All three varieties distinguished at 3000 bp fragments, which means that the source and genetic materials were different in all three varieties at the time of selection (Al-Kordy et al., 2013).

In conclusion, Gujarat Coriander 3 (GCo 3) was recommended for release after 28 years in Gujarat state. GCo 3 had recorded 1501.32 kg/ha seed yield, which was 17.00 per cent higher seed yield than check variety Gujarat Coriander 2 (GCo 2), which directly increase yield and revenue of the farmers from unit area. Absolute linalool is used by pharmaceuticals, food and cosmetic industries. Due to high linalool conten, market rate of GCo3 seeds will also more than other ordinary variety, which will be directly benefited to the farmers. GCo3 will become good choice for export oriented coriander cultivation. To make curry powder a seed with high linalool content always demanding by exporters. In nutshell, GCo3 is complete package with seed yield and quality.

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