

CHAPTER IV

RESULTS

1. Rice

The results of zinc, copper content and Zn/Cu ratio obtained from 30 samples of rice are shown in Table 5. The mean value of zinc content \pm S.D. is $23.6 \pm 3.2 \mu\text{g/g}$ (wet weight) with the range of 17.5-28.8 $\mu\text{g/g}$. The mean value of copper content \pm S.D. is $2.3 \pm 0.6 \mu\text{g/g}$ (wet weight) with the range of 1.1-3.3 $\mu\text{g/g}$. The zinc to copper ratios range from 6.1:1-24.0:1.

2. Glutinous rice

The results of zinc, copper content and Zn/Cu ratio obtained from 30 samples of glutinous rice are shown in Table 6. The mean value of zinc content \pm S.D. is $27.1 \pm 5.6 \mu\text{g/g}$ (wet weight) with the range of 17.8-37.7 $\mu\text{g/g}$. The mean value of copper content \pm S.D. is $2.5 \pm 1.7 \mu\text{g/g}$ (wet weight) with the range of 0.7-5.9 $\mu\text{g/g}$. The zinc to copper ratios range from 5.5:1-36.6:1.

3. Millet

The results of zinc, copper content and Zn/Cu ratio obtained from 30 samples of millet are shown in

Table 7. The mean value of zinc content \pm S.D. is 45.2 ± 8.4 $\mu\text{g/g}$ (wet weight) with the range of 26.2-67.5 $\mu\text{g/g}$. The mean value of copper content \pm S.D. is 6.8 ± 1.3 $\mu\text{g/g}$ (wet weight) with the range of 4.9-10.4 $\mu\text{g/g}$. The zinc to copper ratios range from 4.0:1-10.4:1.

4. Corn

The results of zinc, copper content and Zn/Cu ratio obtained from 30 samples of corn are shown in Table 8. The mean value of zinc content \pm S.D. is 28.5 ± 11.2 $\mu\text{g/g}$ (wet weight) with the range of 15.0-56.0 $\mu\text{g/g}$. The mean value of copper content \pm S.D. is 2.2 ± 0.7 $\mu\text{g/g}$ (wet weight) with the range of 0.9-3.7 $\mu\text{g/g}$. The zinc to copper ratios range from 6.5:1-37.3:1.

Table 5 Zinc, copper content and Zn/Cu ratio in rice

| No. | Concentration ($\mu\text{g/g}$ wet weight) | | Zn/Cu |
|-----|---|-----|--------|
| | Zn | Cu | |
| 1 | 24.0 | 2.8 | 8.6:1 |
| 2 | 24.1 | 1.8 | 13.4:1 |
| 3 | 17.5 | 2.5 | 7.0:1 |
| 4 | 23.5 | 3.2 | 7.3:1 |
| 5 | 23.5 | 2.3 | 10.2:1 |
| 6 | 23.5 | 2.0 | 11.8:1 |
| 7 | 28.0 | 2.6 | 10.8:1 |
| 8 | 23.5 | 2.1 | 11.2:1 |
| 9 | 27.0 | 2.6 | 10.4:1 |
| 10 | 24.0 | 2.4 | 10.0:1 |
| 11 | 27.0 | 2.9 | 9.3:1 |
| 12 | 21.7 | 2.7 | 8.0:1 |
| 13 | 20.7 | 2.7 | 7.7:1 |
| 14 | 20.2 | 3.3 | 6.1:1 |
| 15 | 21.4 | 2.6 | 8.2:1 |
| 16 | 19.5 | 2.9 | 6.7:1 |
| 17 | 18.6 | 2.7 | 6.9:1 |
| 18 | 20.3 | 2.6 | 7.8:1 |
| 19 | 17.8 | 1.7 | 10.5:1 |
| 20 | 23.5 | 1.9 | 12.4:1 |

Table 5 (continued) Zinc, copper content and Zn/Cu ratio in rice.

| No. | Concentration ($\mu\text{g/g}$ wet weight) | | Zn/Cu |
|-------|---|---------|--------------|
| | Zn | Cu | |
| 21 | 24.3 | 1.9 | 12.8:1 |
| 22 | 25.9 | 2.6 | 10.0:1 |
| 23 | 28.1 | 2.3 | 12.2:1 |
| 24 | 24.8 | 2.9 | 8.6:1 |
| 25 | 26.7 | 2.0 | 13.4:1 |
| 26 | 28.0 | 1.4 | 20.0:1 |
| 27 | 28.8 | 1.8 | 16.0:1 |
| 28 | 26.4 | 1.1 | 24.0:1 |
| 29 | 26.1 | 1.5 | 17.4:1 |
| 30 | 20.9 | 1.5 | 13.9:1 |
| Mean | 23.6 | 2.3 | 11.1:1 |
| S. D. | 3.2 | 0.6 | - |
| Range | 17.5-28.8 | 1.1-3.3 | 6.1:1-24.0:1 |

Table 6 Zinc, copper content and Zn/Cu ratio in glutinous rice.

| No. | Concentration($\mu\text{g/g}$ wet weight) | | Zn/Cu |
|-----|--|-----|--------|
| | Zn | Cu | |
| 1 | 25.6 | 0.7 | 36.6:1 |
| 2 | 25.3 | 1.3 | 19.5:1 |
| 3 | 23.0 | 0.8 | 28.8:1 |
| 4 | 19.8 | 1.1 | 18.0:1 |
| 5 | 22.0 | 1.4 | 15.7:1 |
| 6 | 24.3 | 1.2 | 20.3:1 |
| 7 | 22.8 | 1.1 | 20.7:1 |
| 8 | 20.3 | 1.1 | 18.5:1 |
| 9 | 24.5 | 0.9 | 27.2:1 |
| 10 | 18.2 | 1.0 | 18.2:1 |
| 11 | 21.0 | 1.5 | 14.0:1 |
| 12 | 23.5 | 1.7 | 13.8:1 |
| 13 | 23.4 | 1.3 | 18.0:1 |
| 14 | 23.9 | 1.4 | 17.1:1 |
| 15 | 17.8 | 1.2 | 14.8:1 |
| 16 | 31.0 | 3.2 | 9.7:1 |
| 17 | 24.8 | 1.6 | 15.5:1 |
| 18 | 32.1 | 1.0 | 32.1:1 |
| 19 | 32.5 | 4.2 | 7.7:1 |
| 20 | 28.9 | 3.3 | 8.8:1 |

Table 6 (continued) Zinc, copper content and Zn/Cu ratio in glutinous rice

| No. | Concentration($\mu\text{g}/\text{g}$ wet weight) | | Zn/Cu |
|-------|---|---------|--------------|
| | Zn | Cu | |
| 21 | 34.1 | 5.4 | 6.3:1 |
| 22 | 35.9 | 4.0 | 9.0:1 |
| 23 | 27.5 | 4.6 | 6.0:1 |
| 24 | 34.5 | 4.7 | 7.3:1 |
| 25 | 31.4 | 4.4 | 7.1:1 |
| 26 | 32.0 | 3.6 | 8.9:1 |
| 27 | 32.7 | 5.9 | 5.5:1 |
| 28 | 32.5 | 5.3 | 6.1:1 |
| 29 | 37.7 | 3.1 | 12.2:1 |
| 30 | 28.9 | 1.4 | 20.6:1 |
| Mean | 27.1 | 2.5 | 15.5:1 |
| S. D. | 5.6 | 1.7 | - |
| Range | 17.8-37.7 | 0.7-5.9 | 5.5:1-36.6:1 |

Table 7 Zinc, copper content and Zn/Cu ratio in millet

| No. | Concentration($\mu\text{g/g}$ wet weight) | | Zn/Cu |
|-----|--|-----|-------|
| | Zn | Cu | |
| 1 | 41.1 | 7.9 | 5.2:1 |
| 2 | 40.7 | 7.9 | 5.2:1 |
| 3 | 42.0 | 6.0 | 7.0:1 |
| 4 | 42.4 | 6.7 | 6.3:1 |
| 5 | 35.2 | 7.7 | 4.6:1 |
| 6 | 38.4 | 7.5 | 5.1:1 |
| 7 | 38.4 | 7.2 | 5.3:1 |
| 8 | 43.6 | 7.5 | 5.8:1 |
| 9 | 26.2 | 6.6 | 4.0:1 |
| 10 | 43.6 | 8.0 | 5.5:1 |
| 11 | 37.0 | 8.8 | 4.2:1 |
| 12 | 38.0 | 6.4 | 5.9:1 |
| 13 | 47.7 | 5.8 | 8.2:1 |
| 14 | 55.0 | 6.0 | 9.2:1 |
| 15 | 47.5 | 6.6 | 7.2:1 |
| 16 | 45.0 | 5.6 | 8.0:1 |
| 17 | 44.2 | 5.4 | 8.2:1 |
| 18 | 39.8 | 6.2 | 6.4:1 |
| 19 | 44.2 | 5.5 | 8.0:1 |
| 20 | 44.5 | 5.3 | 8.4:1 |

Table 7 (continued) Zinc, copper content and Zn/Cu ratio in millet

| No. | Concentration ($\mu\text{g/g}$ wet weight) | | Zn/Cu |
|-------|---|----------|--------------|
| | Zn | Cu | |
| 21 | 44.0 | 4.9 | 9.0:1 |
| 22 | 47.7 | 5.8 | 8.2:1 |
| 23 | 42.3 | 5.2 | 8.1:1 |
| 24 | 45.8 | 10.4 | 4.4:1 |
| 25 | 55.3 | 7.9 | 7.0:1 |
| 26 | 53.6 | 8.6 | 6.2:1 |
| 27 | 55.3 | 7.5 | 7.4:1 |
| 28 | 64.8 | 7.0 | 9.3:1 |
| 29 | 45.9 | 6.5 | 7.1:1 |
| 30 | 67.5 | 6.5 | 10.4:1 |
| Mean | 45.2 | 6.8 | 6.8:1 |
| S.D. | 8.4 | 1.3 | - |
| Range | 26.2-67.5 | 4.9-10.4 | 4.0:1-10.4:1 |

Table 8 Zinc, copper content and Zn/Cu ratio in corn

| No. | Concentration($\mu\text{g/g}$ wet weight) | | Zn/Cu |
|-----|--|-----|--------|
| | Zn | Cu | |
| 1 | 35.0 | 1.9 | 18.4:1 |
| 2 | 16.5 | 1.8 | 9.2:1 |
| 3 | 25.8 | 2.0 | 12.9:1 |
| 4 | 28.8 | 1.9 | 15.2:1 |
| 5 | 29.0 | 2.5 | 11.6:1 |
| 6 | 27.8 | 2.2 | 12.6:1 |
| 7 | 25.3 | 1.9 | 13.3:1 |
| 8 | 33.8 | 2.3 | 14.7:1 |
| 9 | 30.0 | 2.5 | 12.0:1 |
| 10 | 29.0 | 2.2 | 13.2:1 |
| 11 | 24.8 | 1.4 | 17.7:1 |
| 12 | 27.0 | 1.4 | 19.3:1 |
| 13 | 52.3 | 3.7 | 14.1:1 |
| 14 | 47.8 | 3.5 | 13.7:1 |
| 15 | 47.0 | 3.2 | 14.7:1 |
| 16 | 16.8 | 2.0 | 8.4:1 |
| 17 | 56.0 | 1.5 | 37.3:1 |
| 18 | 35.0 | 3.6 | 9.7:1 |
| 19 | 45.8 | 3.5 | 13.1:1 |
| 20 | 17.8 | 2.2 | 8.1:1 |

Table 8 (continued) Zinc, copper content and Zn/Cu ratio in corn

| No. | Concentration ($\mu\text{g/g}$ wet weight) | | Zn/Cu |
|-------|---|---------|--------------|
| | Zn | Cu | |
| 21 | 18.3 | 1.7 | 10.8:1 |
| 22 | 19.0 | 1.8 | 10.6:1 |
| 23 | 22.0 | 1.6 | 13.8:1 |
| 24 | 15.0 | 2.3 | 6.5:1 |
| 25 | 21.9 | 1.7 | 12.9:1 |
| 26 | 19.9 | 1.6 | 12.4:1 |
| 27 | 21.5 | 1.9 | 11.3:1 |
| 28 | 21.0 | 2.3 | 9.1:1 |
| 29 | 24.3 | 2.5 | 9.7:1 |
| 30 | 20.0 | 0.9 | 22.2:1 |
| Mean | 28.5 | 2.2 | 13.6:1 |
| S.D. | 11.2 | 0.7 | - |
| Range | 15.0-56.0 | 0.9-3.7 | 6.5:1-37.3:1 |

Table 9 Statistical comparison of zinc content in rice,
glutinous rice, millet and corn

| Statistic | Rice | Glutinous rice | Millet | Corn |
|-----------|-----------|-------------------|-----------|-----------|
| n | 30 | 30 | 30 | 30 |
| Mean | 23.6 | 27.1 | 45.2 | 28.5 |
| S.D. | 3.2 | 5.6 | 8.4 | 11.2 |
| Range | 17.5-28.8 | 17.8-37.7 | 26.2-67.5 | 15.0-56.0 |

Table 10 Statistical comparison of copper content in rice,
glutinous rice, millet and corn

| Statistic | Rice | Glutinous rice | Millet | Corn |
|-----------|---------|-------------------|----------|---------|
| n | 30 | 30 | 30 | 30 |
| Mean | 2.3 | 2.5 | 6.8 | 2.2 |
| S.D. | 0.6 | 1.7 | 1.3 | 0.7 |
| Range | 1.1-3.3 | 0.7-5.9 | 4.9-10.4 | 0.9-3.7 |

Table 11 Statistical comparison of Zn/Cu ratio in rice, glutinous rice, millet and corn.

| Statistic | Rice | Glutinous rice | Millet | Corn |
|-----------|--------------|----------------|--------------|--------------|
| n | 30 | 30 | 30 | 30 |
| Mean | 11.1:1 | 15.5:1 | 6.8:1 | 13.6:1 |
| Range | 6.1:1-24.0:1 | 5.5:1-36.6:1 | 4.0:1-10.4:1 | 6.5:1-37.3:1 |

