Table S1. Characteristics of the control population and patients with gastrointestinal cancers.

| Characteristic   | Control population | Gastrointestinal cancer patients |  \( X^2/df/P-value \) |
|------------------|--------------------|----------------------------------|------------------------|
|                  | No. examined (%)   | No. examined (%)                 |                        |
|                  | n=141              | n=195                            |                        |
| **Age (years)**  |                    |                                  |                        |
| ≤50              | 22 (15.6)          | 44 (22.56)                       | 2.125/2/0.346          |
| 51-60            | 41 (29.08)         | 61 (31.28)                       |                        |
| >60              | 78 (55.32)         | 90 (46.15)                       |                        |
| **Sex**          |                    |                                  |                        |
| Male             | 70 (49.65)         | 125 (64.1)                       | 3.998/1/0.046          |
| Female           | 71 (50.35)         | 70 (35.9)                        |                        |
| **Residence**    |                    |                                  |                        |
| Urban            | 90 (63.83)         | 113 (57.95)                      | 0.757/1/0.384          |
| Rural            | 51 (36.17)         | 82 (42.05)                       |                        |
Table S2. Characteristics and *Cryptosporidium* spp. infection information of 195 gastrointestinal cancer patients

| Sex   | Age | Residence | Cancer types     | Cryptosporidium spp. infection | Cryptosporidium spp. species | Cryptosporidium spp. genotype |
|-------|-----|-----------|------------------|-------------------------------|-----------------------------|-------------------------------|
| 1     | Male | 63       | Urban            | Colorectal cancer             | Positive                    | *C. parvum*                  | IlaA15G2R1                   |
| 2     | Male | 51       | Urban            | Colorectal cancer             | Positive                    | *C. parvum*                  | IlaA15G2R2                   |
| 3     | Male | 55       | Urban            | Colorectal cancer             | Positive                    | *C. parvum*                  | IlaA15G2R2                   |
| 4     | Male | 40       | Urban            | Colorectal cancer             | Positive                    | *C. parvum*                  | IlaA15G2R2                   |
| 5     | Male | 68       | Urban            | Colorectal cancer             | Positive                    | *C. parvum*                  | IlaA15G2R1                   |
| 6     | Male | 78       | Urban            | Colorectal cancer             | Positive                    | *C. parvum*                  | IlaA15G2R2                   |
| 7     | Male | 53       | Urban            | Colorectal cancer             | Positive                    | *C. parvum*                  | IlaA15G2R1                   |
| 8     | Male | 61       | Urban            | Colorectal cancer             | Positive                    | *C. parvum*                  | IlaA15G2R2                   |
| 9     | Male | 69       | Urban            | Colorectal cancer             | Positive                    | *C. parvum*                  | IlaA15G2R2                   |
| 10    | Male | 35       | Urban            | Colorectal cancer             | Positive                    | *C. parvum*                  | IlaA15G2R2                   |
| 11    | Male | 62       | Rural            | Colorectal cancer             | Positive                    | *C. parvum*                  | IlaA15G2R1                   |
| 12    | Male | 62       | Rural            | Colorectal cancer             | Positive                    | *C. parvum*                  | IlaA15G2R1                   |
| 13    | Male | 80       | Rural            | Colorectal cancer             | Positive                    | *C. parvum*                  | IlaA15G2R1                   |
| 14    | Male | 46       | Rural            | Colorectal cancer             | Positive                    | *C. parvum*                  | IlaA15G2R1                   |
| 15    | Male | 63       | Rural            | Colorectal cancer             | Positive                    | *C. parvum*                  | IlaA15G2R1                   |
| 16    | Female | 66     | Urban             | Colorectal cancer             | Positive                    | *C. parvum*                  | IlaA15G2R1                   |
| 17    | Female | 48     | Urban             | Colorectal cancer             | Positive                    | *C. parvum*                  | IlaA15G2R1                   |
| 18    | Female | 61     | Rural             | Colorectal cancer             | Positive                    | *C. parvum*                  | IlaA15G2R2                   |
| 19    | Female | 59     | Rural             | Colorectal cancer             | Positive                    | *C. parvum*                  | IlaA15G2R2                   |
| 20    | Female | 48     | Rural             | Colorectal cancer             | Positive                    | *C. parvum*                  | IlaA15G2R2                   |
| 21    | Male | 65       | Urban            | Colorectal cancer             | Negative                    | -                             | -                             |
| 22    | Male | 52       | Urban            | Colorectal cancer             | Negative                    | -                             | -                             |
| 23    | Male | 36       | Urban            | Colorectal cancer             | Negative                    | -                             | -                             |
|   | Gender | Age | Location | Disease Type    | Test Result | - | - |
|---|--------|-----|----------|-----------------|-------------|---|---|
| 24| Male   | 46  | Urban    | Colorectal cancer | Negative   | - | - |
| 25| Male   | 65  | Urban    | Colorectal cancer | Negative   | - | - |
| 26| Male   | 50  | Urban    | Colorectal cancer | Negative   | - | - |
| 27| Male   | 57  | Urban    | Colorectal cancer | Negative   | - | - |
| 28| Male   | 58  | Urban    | Colorectal cancer | Negative   | - | - |
| 29| Male   | 59  | Urban    | Colorectal cancer | Negative   | - | - |
| 30| Male   | 33  | Urban    | Colorectal cancer | Negative   | - | - |
| 31| Male   | 52  | Urban    | Colorectal cancer | Negative   | - | - |
| 32| Male   | 60  | Urban    | Colorectal cancer | Negative   | - | - |
| 33| Male   | 79  | Urban    | Colorectal cancer | Negative   | - | - |
| 34| Male   | 48  | Urban    | Colorectal cancer | Negative   | - | - |
| 35| Male   | 49  | Urban    | Colorectal cancer | Negative   | - | - |
| 36| Male   | 59  | Urban    | Colorectal cancer | Negative   | - | - |
| 37| Male   | 61  | Urban    | Colorectal cancer | Negative   | - | - |
| 38| Male   | 45  | Urban    | Colorectal cancer | Negative   | - | - |
| 39| Male   | 48  | Urban    | Colorectal cancer | Negative   | - | - |
| 40| Male   | 66  | Urban    | Colorectal cancer | Negative   | - | - |
| 41| Male   | 43  | Urban    | Colorectal cancer | Negative   | - | - |
| 42| Male   | 55  | Urban    | Colorectal cancer | Negative   | - | - |
| 43| Male   | 63  | Urban    | Colorectal cancer | Negative   | - | - |
| 44| Male   | 74  | Urban    | Colorectal cancer | Negative   | - | - |
| 45| Male   | 63  | Urban    | Colorectal cancer | Negative   | - | - |
| 46| Male   | 70  | Urban    | Colorectal cancer | Negative   | - | - |
| 47| Male   | 59  | Urban    | Colorectal cancer | Negative   | - | - |
| 48| Male   | 60  | Urban    | Colorectal cancer | Negative   | - | - |
| 49| Male   | 68  | Urban    | Colorectal cancer | Negative   | - | - |
|   |   |   |                          |      |   |   |
|---|---|---|--------------------------|------|---|---|
| 50| Male| 54| Rural                    | Colorectal cancer | Negative | - |
| 51| Male| 57| Rural                    | Colorectal cancer | Negative | - |
| 52| Male| 66| Rural                    | Colorectal cancer | Negative | - |
| 53| Male| 54| Rural                    | Colorectal cancer | Negative | - |
| 54| Male| 66| Rural                    | Colorectal cancer | Negative | - |
| 55| Male| 57| Rural                    | Colorectal cancer | Negative | - |
| 56| Male| 61| Rural                    | Colorectal cancer | Negative | - |
| 57| Male| 56| Rural                    | Colorectal cancer | Negative | - |
| 58| Male| 68| Rural                    | Colorectal cancer | Negative | - |
| 59| Male| 64| Rural                    | Colorectal cancer | Negative | - |
| 60| Male| 50| Rural                    | Colorectal cancer | Negative | - |
| 61| Male| 68| Rural                    | Colorectal cancer | Negative | - |
| 62| Male| 61| Rural                    | Colorectal cancer | Negative | - |
| 63| Male| 61| Rural                    | Colorectal cancer | Negative | - |
| 64| Male| 65| Rural                    | Colorectal cancer | Negative | - |
| 65| Male| 61| Rural                    | Colorectal cancer | Negative | - |
| 66| Male| 53| Rural                    | Colorectal cancer | Negative | - |
| 67| Male| 50| Rural                    | Colorectal cancer | Negative | - |
| 68| Male| 58| Rural                    | Colorectal cancer | Negative | - |
| 69| Male| 54| Urban                    | Colorectal cancer | Negative | - |
| 70| Male| 59| Rural                    | Colorectal cancer | Negative | - |
| 71| Male| 45| Rural                    | Colorectal cancer | Negative | - |
| 72| Male| 52| Rural                    | Colorectal cancer | Negative | - |
| 73| Female| 56| Urban                   | Colorectal cancer | Negative | - |
| 74| Female| 63| Urban                   | Colorectal cancer | Negative | - |
| 75| Female| 68| Urban                   | Colorectal cancer | Negative | - |
|   |   |   |             |      |   |
|---|---|---|-------------|------|---|
| 76| Female| 62| Urban| Colorectal cancer| Negative| -|
| 77| Female| 63| Urban| Colorectal cancer| Negative| -|
| 78| Female| 60| Urban| Colorectal cancer| Negative| -|
| 79| Female| 47| Urban| Colorectal cancer| Negative| -|
| 80| Female| 66| Urban| Colorectal cancer| Negative| -|
| 81| Female| 69| Urban| Colorectal cancer| Negative| -|
| 82| Female| 65| Urban| Colorectal cancer| Negative| -|
| 83| Female| 48| Urban| Colorectal cancer| Negative| -|
| 84| Female| 48| Urban| Colorectal cancer| Negative| -|
| 85| Female| 53| Urban| Colorectal cancer| Negative| -|
| 86| Female| 67| Urban| Colorectal cancer| Negative| -|
| 87| Female| 63| Urban| Colorectal cancer| Negative| -|
| 88| Female| 48| Urban| Colorectal cancer| Negative| -|
| 89| Female| 59| Urban| Colorectal cancer| Negative| -|
| 90| Female| 74| Urban| Colorectal cancer| Negative| -|
| 91| Female| 51| Urban| Colorectal cancer| Negative| -|
| 92| Female| 63| Urban| Colorectal cancer| Negative| -|
| 93| Female| 52| Urban| Colorectal cancer| Negative| -|
| 94| Female| 64| Urban| Colorectal cancer| Negative| -|
| 95| Female| 64| Urban| Colorectal cancer| Negative| -|
| 96| Female| 65| Urban| Colorectal cancer| Negative| -|
| 97| Female| 66| Urban| Colorectal cancer| Negative| -|
| 98| Female| 63| Urban| Colorectal cancer| Negative| -|
| 99| Female| 68| Urban| Colorectal cancer| Negative| -|
|100| Female| 70| Urban| Colorectal cancer| Negative| -|
|101| Female| 74| Urban| Colorectal cancer| Negative| -|
|   |   |   |   |   |   |
|---|---|---|---|---|---|
| 102| Female | 61 | Urban | Colorectal cancer | Negative |
| 103| Female | 36 | Rural | Colorectal cancer | Negative |
| 104| Female | 50 | Rural | Colorectal cancer | Negative |
| 105| Female | 61 | Rural | Colorectal cancer | Negative |
| 106| Female | 65 | Rural | Colorectal cancer | Negative |
| 107| Female | 48 | Rural | Colorectal cancer | Negative |
| 108| Female | 41 | Rural | Colorectal cancer | Negative |
| 109| Female | 69 | Rural | Colorectal cancer | Negative |
| 110| Female | 44 | Rural | Colorectal cancer | Negative |
| 111| Female | 70 | Rural | Colorectal cancer | Negative |
| 112| Female | 45 | Rural | Colorectal cancer | Negative |
| 113| Female | 47 | Rural | Colorectal cancer | Negative |
| 114| Female | 53 | Rural | Colorectal cancer | Negative |
| 115| Female | 83 | Rural | Colorectal cancer | Negative |
| 116| Female | 65 | Rural | Colorectal cancer | Negative |
| 117| Male | 78 | Urban | Gastric cancer | Positive | C. parvum | IlaA15G2R1 |
| 118| Male | 49 | Urban | Gastric cancer | Positive | C. parvum | IlaA15G2R2 |
| 119| Male | 56 | Urban | Gastric cancer | Negative |
| 120| Male | 60 | Urban | Gastric cancer | Negative |
| 121| Male | 72 | Urban | Gastric cancer | Negative |
| 122| Male | 43 | Urban | Gastric cancer | Negative |
| 123| Male | 57 | Urban | Gastric cancer | Negative |
| 124| Male | 68 | Urban | Gastric cancer | Negative |
| 125| Male | 55 | Urban | Gastric cancer | Negative |
| 126| Male | 61 | Urban | Gastric cancer | Negative |
| 127| Male | 79 | Urban | Gastric cancer | Negative |
|   | Gender | Age  | Residence | Condition | Grade | Stage |
|---|--------|------|-----------|-----------|-------|-------|
| 128| Male   | 61   | Urban     | Gastric cancer | Negative | -     |
| 129| Male   | 31   | Urban     | Gastric cancer | Negative | -     |
| 130| Male   | 68   | Urban     | Gastric cancer | Negative | -     |
| 131| Male   | 63   | Urban     | Gastric cancer | Negative | -     |
| 132| Male   | 58   | Urban     | Gastric cancer | Negative | -     |
| 133| Male   | 58   | Urban     | Gastric cancer | Negative | -     |
| 134| Male   | 75   | Rural     | Gastric cancer | Negative | -     |
| 135| Male   | 48   | Rural     | Gastric cancer | Negative | -     |
| 136| Male   | 57   | Rural     | Gastric cancer | Negative | -     |
| 137| Male   | 59   | Rural     | Gastric cancer | Negative | -     |
| 138| Male   | 53   | Rural     | Gastric cancer | Negative | -     |
| 139| Male   | 64   | Rural     | Gastric cancer | Negative | -     |
| 140| Male   | 62   | Rural     | Gastric cancer | Negative | -     |
| 141| Male   | 64   | Rural     | Gastric cancer | Negative | -     |
| 142| Male   | 73   | Rural     | Gastric cancer | Negative | -     |
| 143| Male   | 67   | Rural     | Gastric cancer | Negative | -     |
| 144| Male   | 55   | Rural     | Gastric cancer | Negative | -     |
| 145| Male   | 60   | Rural     | Gastric cancer | Negative | -     |
| 146| Male   | 60   | Rural     | Gastric cancer | Negative | -     |
| 147| Male   | 65   | Rural     | Gastric cancer | Negative | -     |
| 148| Male   | 60   | Rural     | Gastric cancer | Negative | -     |
| 149| Male   | 63   | Rural     | Gastric cancer | Negative | -     |
| 150| Male   | 40   | Rural     | Gastric cancer | Negative | -     |
| 151| Male   | 45   | Rural     | Gastric cancer | Negative | -     |
| 152| Male   | 38   | Rural     | Gastric cancer | Negative | -     |
| 153| Male   | 64   | Rural     | Gastric cancer | Negative | -     |
| ID | Gender | Age | Residence | Cancer Type | Tumor Status | Other | Pathology |
|----|--------|-----|-----------|-------------|-------------|-------|-----------|
| 154 | Male   | 66  | Rural     | Gastric cancer | Negative  | -     | -         |
| 155 | Female | 44  | Urban     | Gastric cancer | Negative  | -     | -         |
| 156 | Female | 58  | Urban     | Gastric cancer | Negative  | -     | -         |
| 157 | Female | 53  | Urban     | Gastric cancer | Negative  | -     | -         |
| 158 | Female | 75  | Urban     | Gastric cancer | Negative  | -     | -         |
| 159 | Female | 87  | Urban     | Gastric cancer | Negative  | -     | -         |
| 160 | Female | 58  | Urban     | Gastric cancer | Negative  | -     | -         |
| 161 | Female | 56  | Urban     | Gastric cancer | Negative  | -     | -         |
| 162 | Female | 42  | Urban     | Gastric cancer | Negative  | -     | -         |
| 163 | Female | 54  | Rural     | Gastric cancer | Negative  | -     | -         |
| 164 | Female | 45  | Rural     | Gastric cancer | Negative  | -     | -         |
| 165 | Female | 42  | Rural     | Gastric cancer | Negative  | -     | -         |
| 166 | Female | 54  | Rural     | Gastric cancer | Negative  | -     | -         |
| 167 | Female | 80  | Rural     | Gastric cancer | Negative  | -     | -         |
| 168 | Female | 55  | Rural     | Esophageal cancer | Positive | C. parvum | IlaA15G2R2 |
| 172 | Male   | 61  | Urban     | Esophageal cancer | Negative | -     | -         |
| 173 | Male   | 46  | Urban     | Esophageal cancer | Negative | -     | -         |
| 174 | Male   | 59  | Urban     | Esophageal cancer | Negative | -     | -         |
| 175 | Male   | 66  | Urban     | Esophageal cancer | Negative | -     | -         |
| 179 | Male   | 60  | Urban     | Esophageal cancer | Negative | -     | -         |
| 180 | Male   | 64  | Urban     | Esophageal cancer | Negative | -     | -         |
| 181 | Male   | 69  | Urban     | Esophageal cancer | Negative | -     | -         |
| 169 | Male   | 68  | Rural     | Esophageal cancer | Negative | -     | -         |
| 170 | Male   | 55  | Rural     | Esophageal cancer | Negative | -     | -         |
| 171 | Male   | 55  | Rural     | Esophageal cancer | Negative | -     | -         |
| 176 | Male   | 49  | Rural     | Esophageal cancer | Negative | -     | -         |
| ID  | Gender | Age  | Rural/Urban | Cancer Type      | Status    | C. parvum | Strain  |
|-----|--------|------|-------------|-----------------|-----------|-----------|---------|
| 177 | Male   | 66   | Rural       | Esophageal cancer | Negative  | -         | -       |
| 182 | Male   | 58   | Rural       | Esophageal cancer | Negative  | -         | -       |
| 175 | Female | 63   | Rural       | Esophageal cancer | Negative  | -         | -       |
| 183 | Female | 63   | Rural       | Esophageal cancer | Negative  | -         | -       |
| 184 | Male   | 52   | Urban       | Liver cancer     | Positive  | C. parvum | IIaA15G2R2|
| 185 | Male   | 42   | Urban       | Liver cancer     | Negative  | -         | -       |
| 186 | Male   | 82   | Urban       | Liver cancer     | Negative  | -         | -       |
| 187 | Male   | 55   | Urban       | Liver cancer     | Negative  | -         | -       |
| 188 | Male   | 49   | Rural       | Liver cancer     | Negative  | -         | -       |
| 189 | Female | 45   | Rural       | Liver cancer     | Negative  | -         | -       |
| 190 | Female | 63   | Rural       | Liver cancer     | Negative  | -         | -       |
| 191 | Male   | 55   | Urban       | Small intestine cancer | Positive | C. parvum | IIaA15G2R2|
| 192 | Male   | 58   | Urban       | Small intestine cancer | Positive | C. parvum | IIaA15G2R1|
| 193 | Female | 63   | Urban       | Small intestine cancer | Negative | -         | -       |
| 194 | Female | 65   | Urban       | Small intestine cancer | Negative | -         | -       |
| 195 | Female | 58   | Urban       | Small intestine cancer | Negative | -         | -       |
Table S3. Frequencies of *Cryptosporidium* spp. in colorectal cancer patients by age, sex and residence (n=116).

| Characteristic | No. examined | No. positive | %  | $X^2$/df/P-value |
|----------------|--------------|--------------|----|-----------------|
| **Age (years)** |              |              |    |                 |
| ≤50            | 28           | 5            | 17.86 | 1.488/2/0.475   |
| 51-60          | 31           | 4            | 12.9  |                |
| >60            | 57           | 11           | 19.3  |                 |
| **Sex**        |              |              |    |                 |
| Male           | 67           | 15           | 22.39 | 5.357/1/0.021   |
| Female         | 49           | 5            | 10.2  |                 |
| **Residence**  |              |              |    |                 |
| Urban          | 72           | 12           | 16.67 | 0.035/1/0.852   |
| Rural          | 44           | 8            | 18.18 |                 |
Table S4. Information for the reference sequences used in this study.

| GenBank ID  | Isolate     | Species       | Genotype | Host     | Product                              | Country      |
|-------------|-------------|---------------|----------|----------|--------------------------------------|--------------|
| JX886765.1  | CpB3        | *C. parvum*   | -        | Cattle   | small subunit ribosomal RNA          | Turkey       |
| JX886766.1  | CpB4        | *C. parvum*   | -        | Cattle   | small subunit ribosomal RNA          | Turkey       |
| JX886767.1  | CpB5        | *C. parvum*   | -        | Cattle   | small subunit ribosomal RNA          | Turkey       |
| JX886768.1  | CpB6        | *C. parvum*   | -        | Cattle   | small subunit ribosomal RNA          | Turkey       |
| FJ752165.1  | Tulare Dairy| *C. parvum*   | -        | Dairy calf| 18S ribosomal RNA                    | USA          |
| AY262034.1  | 2636        | *C. parvum*   | IlaA15G2R1| -       | 60 kDa glycoprotein                  | USA          |
| DQ192501.1  | 9871        | *C. parvum*   | IlaA15G2R2| Homo sapiens| 60 kDa glycoprotein                  | Canada       |